The Builder.

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The Widening of London Bridge.

THE Bridge House Estates Committee announce that they have determined on carrying out, subject to the sanction of Parliament, a scheme for widening the footways of London Bridge; a scheme which is illustrated in a model which has been on view at the Guildhall, and in the diagrams accompanying the Report of the Committee on the subject. From this Report it appears to be now definitely decided that the widening only affects the footways; and the reason given for this is that, while the Tower Bridge has very considerably relieved London Bridge as far as vehicular traffic is concerned, the pedestrian traffic over the latter has in no way diminished. As the bridge is now to be remodelled it would have 34 ft. 6 in. of roadway for four lines of vehicles, 2 ft. 6 in. in the centre for central lighting, and 14 ft. each for the footways, in place of the present width of 9 ft. 6 in. each.

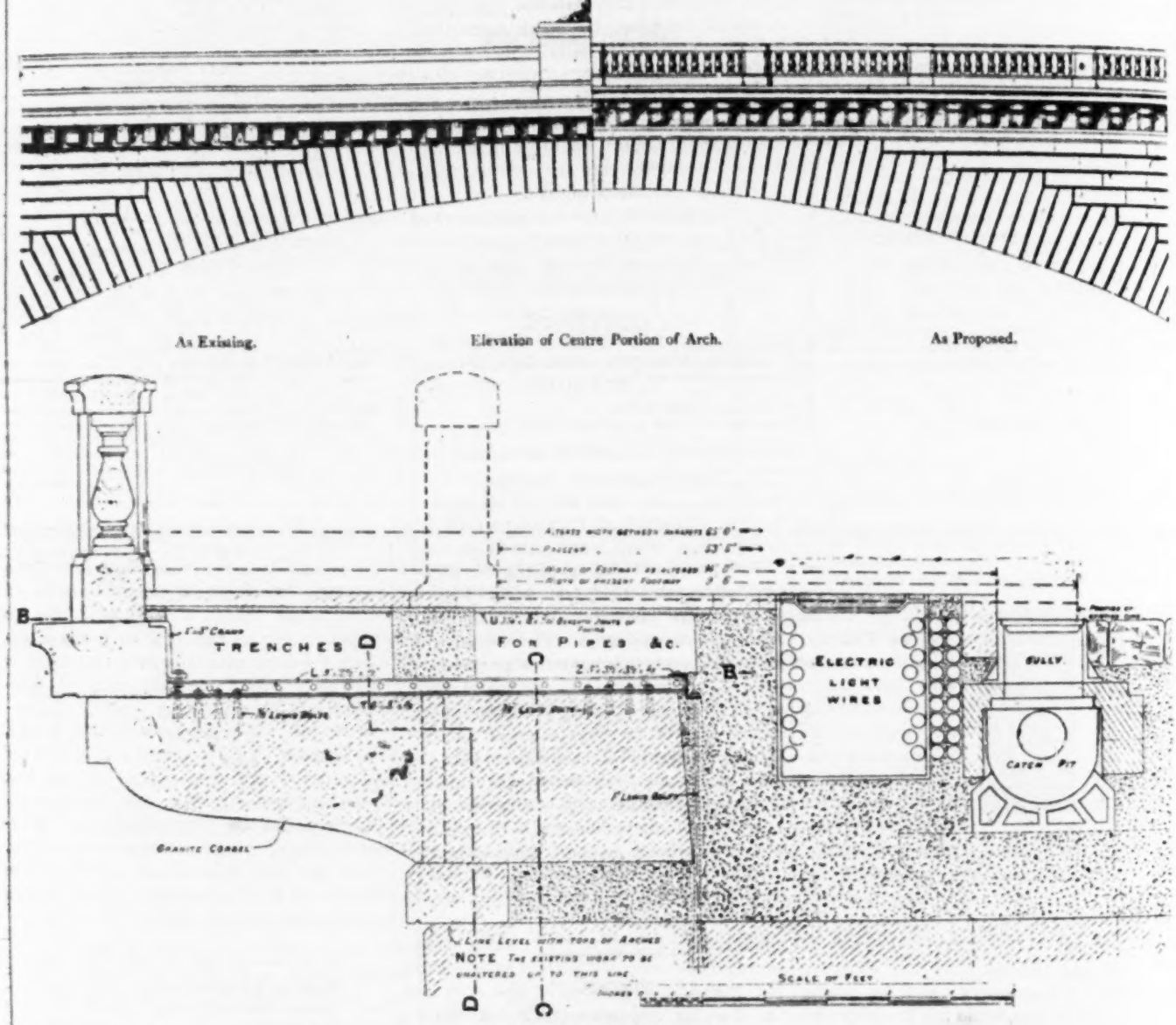
The Committee have abandoned the idea of adding cast-iron cantilevers and a cast-iron balustrade, not apparently, however (if we may judge from the wording of the Report) from any care on their own part for the appearance of the bridge, but because of a conviction, which seems to have been fortunately brought home to them, that such a proposal would meet with the same opposition as before, and they have at all events recognised the practical wisdom of proposing what they are most likely to be allowed to carry out. If the Bridge House Estates Committee had any real regard for the architectural appearance of the bridge they would never have entertained such a scheme as the iron cantilevers at all. As it is, they enlarge upon its practical advantages, but conclude that they will not be allowed to adopt it. It is well that we have got as far as that, at all events.

The model shows, on its two sides, two alternative schemes for a granite corbelling to carry the extended footway. On one side the corbelling is continuous, in the shape of an assemblage of large mouldings carried along between the projecting piers; on the other side it takes the form of granite cantilevers with an interspace a little greater than their width. The former design has been erroneously published in a weekly illustrated paper as the one adopted; as a matter of fact the separate cantilever design has been adopted, and with good reason; it puts less than half the weight on the structure, and is more in keeping with its character; it is a kind of reminiscence, indeed, of the existing corbels or modillions under the parapet string course. We give a small portion of the arch from the drawing published with the Report, showing the difference, in elevation, between the present design and the proposed one—the drawing is a large one, and we could not reduce it sufficiently to give the whole arch on our page; and we give also the section of the parapet and footwalk as proposed, showing the side elevation of the cantilever. This is somewhat clumsy in form, and might be considerably improved. We must admit, however—opposed as we are to any interference with the bridge—that the design now proposed is less objectionable than we had expected. It is at any rate monumental in character, and the projection of the cantilevers is kept within the line of the present projection at the piers of the bridge, so as to appear to some extent to preserve a relation to the existing design. The substitution of an open balustrade for the present solid one was of course inevitable in such a position, for considerations both of real and apparent lightness.

Nevertheless, when the best has been said for it, this will form a very heavy and disproportionate cornice (for such it must be regarded) to the bridge, and will very materially alter its appearance and what may be called its architectural balance; nor can a model on a small scale enable people to realise what the effect will be in execution. The scheme is better than might have been expected, but it would nevertheless be an injury to the design of the bridge, and we feel no conviction whatever as to its necessity. We have never observed that there is any such crowd on the existing footwalks as to cause any material inconvenience or delay in crossing the bridge, but we were hardly prepared to find that the schedule of test observations of the foot traffic, appended to this very Report, actually negatives the Committee's own statement in regard to the increase of the traffic. From the list of observed records of the number of foot passengers over the bridge in twelve hours we extract the following:—

	Number of Persons Passing.
February 6, 1875	91,685
June 30, 1879	88,320
July 25, 1894	81,820
November 12, 1900	83,290

Thus it will be seen that while the most recent observation, last month, shows only a very slight increase, hardly worth mentioning, over the traffic of 1894, it is considerably less than that of 1875 and 1879. Thus the Committee's own statistics answer their own argument. It is odd that we have for years heard reiterated complaints—also we think much exaggerated, but still not without foundation—in regard to the inadequacy of the carriageway; this was always the point insisted on. Now that it has been discovered that vehicular traffic is so far relieved by the Tower Bridge that there is no longer ground for this complaint, the argument is shifted to the footways. This is only in accordance with that spirit of meddling with and spoiling ancient structures which seems to pervade all official authorities in London. The Committee seem determined to lay their hands on the bridge in some way or other; and the old excuse having been snatched from them, they now bring forward a new one. The prevalent official idea seems to be—never let an ancient structure alone if you can find an excuse for meddling with it. The proper feeling ought to be—never meddle with an ancient structure unless there is absolute



Section of Parapet, Showing Cantilever.

Proposed Alterations to London Bridge.

necessity for it. The necessity is certainly not proved in this instance.

Sir Benjamin Baker's Report, which is appended to that of the Committee, is of considerable interest. He says that the widening of the bridge by any other process than that of corbelling out would involve some risk to the present structure.

"If the piled foundations were extended, the vibration arising from the driving of the piles might cause settlements, and I had for that reason to abandon piling in a somewhat similar case in Scotland, and to substitute cylinder foundations. The sinking of cylinders or compressed air caissons near to the old piling of London Bridge might, however, cause even a more serious settlement than pile driving."

It is satisfactory to find that, in spite of some movement in the piled foundations at an early period in the history of the bridge, there is no evidence of any settlement worth taking into account for more than half a century past; so that the bridge seems to have fairly come to its bearings, and it is certainly a point of wisdom, in such a case, *quieta non movere*. As to the additional weight of the corbelling, it is calculated to amount only to 67 lbs. per square foot on the foundations, which, as the engineer observes, is a negligible quantity. But in regard to the appearance of the alteration Sir Benjamin Baker has a significant paragraph:

"I have seen many masonry arch bridges at home and abroad which have been widened by corbelling out the footpaths, but although in some cases much ingenuity has been exercised in the attempt to make the corbelling appear an integral part of the design, complete success has not in my opinion been in any instance achieved. There is no doubt that the corbelling out of the footpaths and the substitution of open balustrades for the present solid parapets would materially alter the appearance of the bridge from an architectural point of view, and I think that before any decision is come to on the subject it would be well to prepare a model of the centre arch of the bridge to a scale of say 5 or 6 ft. to the inch, showing on one side the existing arrangement, and on the other side the granite corbels and open balustrade, as no drawing will enable the Committee to form an opinion as to the real effect of the alteration."

Considering that this is the spontaneous expression of an eminent engineer who was called in to advise only on the constructional aspect of the work, and who, as an engineer, can hardly be supposed to have any strong prejudices in favour of the æsthetic view of the matter, we would suggest that this paragraph in his Report is of great weight, and ought to receive every consideration. And in regard to the argument for the necessity of greater accommodation, the Bridge House Estates Committee, as already pointed out, have actually stultified themselves by their own statistics. Under these circumstances we hope that they will not obtain Parliamentary sanction to spoil London Bridge.

THE L.C.C. AND WORKING-CLASS DWELLINGS.

SOME of our readers may remember that Parliament last Session passed an Act which enlarges the operation of the Housing of the Working Classes Act of 1890 by permitting Local Authorities to purchase land outside their own area. If locomotion by rail or tramways is to be of any real value in solving the difficulties in regard to the housing of the working classes, it is obvious that advantage should be taken of the Act of last Session. It is very satisfactory, therefore, to find the London County Council proposing already

to make use of this new machinery. The place which they have suggested for the new buildings is at Norbury, in Surrey, on the western side of the road from Streatham to Croydon, and a quarter of a mile from the London and Brighton station. The return fare for workmen is fourpence. In addition, there will, within the next two years, be tramway connexion with the lines of the County Council.

It is proposed that the frontage shall be reserved for shops. On the actual plot there will be built 551 single cottages of three, four, and five rooms each, and 211 double cottages. The rent of the single cottages with three rooms will be 7s. to 9s. per week; the double, 6s. 6d. to 11s. 6d., according to their size. Such are the outlines of this the first scheme under the new Act, which stands for early consideration in the agenda of the Council.

The number of inhabitants in this workman's colony will, of course, be large, and it is at once obvious that the success of the scheme must, to some extent, depend on the facilities which are given by the Railway Company for the conveyance of the workers to and from their daily labour. A mechanic, no more than a merchant, can put up with unpunctuality and slowness. He wants to get to and from his work as rapidly as he can. If the facilities for locomotion in a locality which is selected for working class dwellings are inadequate, it is pretty certain that workmen who are engaged at a distance during the day will not make use of it. Another point which has to be borne in mind is, that a workman living in a corner of the outskirts of London cannot reach different places within the Metropolitan area with the same ease as he can from a more central point. A bricklayer is not like a City merchant; he has now to work here and now there. Norbury may be convenient for one district in London; it may be very inconvenient for another. Thus it is clear that this new departure is something in the nature of an experiment.

A working colony, placed in what is in a sense a country district, will also be in a different condition from one in the town itself. Something in the nature of a town will soon, we may expect, spring up round it. But a strain will quickly be placed on the educational system of the district, and the first need for workmen's families is an easily accessible and efficient elementary school. Another matter also which deserves consideration is the question of recreation. The shorter hours of the workman give greater opportunities for recreation. Is the inhabitant of one of the Norbury cottages to have anything provided for him in this respect? Or is Mitcham Common to be his only pleasure-ground? A cricket and football ground, and a reading-room and library, and a coffee-house at once suggest themselves as necessary appurtenances to an artisan's colony pitched outside the Metropolitan area. For it is clear that colonies planted outside the Metropolis or the great provincial towns must be regarded in a broader light than ordinary workmen's dwellings erected in a crowded part of a great city. In the one case the Local Authority is rather running against the tendencies and habits of those who have to inhabit these buildings; in the other it is acting in accordance with their practice, which is to crowd into the towns, as near as possible to their work, to the parts where they may obtain all that a city can provide for them. In the one case, also, it is only an experiment from the financial point of view; in the other it is an experiment not only from the financial, but from the social point of view.

It is most desirable, therefore, that great care should be taken by Local Authorities before they decide to build outside their areas, or what is certainly an excellent piece of legislation may not bear the hoped-for fruit. It will be desirable, also, for the London County Council not to multiply these colonies too rapidly, but to observe their results from that at Norbury before committing themselves to large expenditure. We believe that years ago Baroness Burdett Coutts built, at Highgate, small houses intended for hardworking and poor clerks: they have often been found to be the homes of quite another class. The stream of popular tendency sets strongly in these days towards the city, and it may be that the artisan will not care to go against it.

While we are dealing with this social problem it may be desirable to say a word on a letter from the Sanitary Institute which, we understand, has been sent to the members of the Government, enclosing a copy of the resolutions which were passed at the Conference on the Housing of the Working Classes which was held last July. These resolutions were noticed in this journal at the time they were passed. The two points contained in them are that the period for repayment of loans to Local Authorities should be extended to sixty years, and that the restrictions on building cottages should be relaxed by the Local Government Board. These points are well worthy of being pressed on the notice of this Department, but we doubt if the circular will have any effect. The proper manner of bringing it effectually to Mr. Long's notice is by a deputation. Cabinet Ministers, like editors, have waste-paper baskets.

NOTES.

The London Water Supply.

THE speech which Mr. Ritchie, the new Home Secretary, delivered at the recent banquet to the Mayors of the new London boroughs pointed—not obscurely—to a more sympathetic policy on the part of the Government with the London County Council, more especially in regard to the water question. They should be allowed to pass all Bills which are reasonably necessary, and which, as the Council for London, they deem desirable. Such in effect were the Home Secretary's words. If this policy is carried into action, it points clearly to the intention of the Government not to oppose the water plans of the County Council. It is high time London was left to manage its affairs without interruption from the Government. The absence of municipal spirit in London is owing in some measure to the fact that it is regarded as falling under the control of the Central Government. We hope Mr. Ritchie will be able to obtain the sanction of his colleagues to a policy of non-intervention in the municipal affairs of London.

Proposed New Lambeth Bridge.

BY the courtesy of the Engineer to the London County Council we have had an opportunity of seeing the four sketch elevations which have been made for the proposed Lambeth Bridge. These consist of a cross-braced bridge—a lattice arch through which the straight line of the roadway is carried; a suspension bridge; a steel bridge of the same type as Westminster Bridge, but with fewer and wider spans; and a concrete bridge faced with granite, of the same type constructionally as the new Vauxhall Bridge. Of these however, it may be taken that the cross-braced bridge and the suspension bridge are practically abandoned, as it is a condition that the roadway should allow of a trough 2 ft. 6 in. deep for electric tram motors, and this of course cannot be got, in a construction where there must be cross girders, without building up the roadway on the top of the girders to an inconvenient thickness. It will lie therefore between the Westminster Bridge type and the concrete and granite type, and it is understood that Sir A. Binnie is in favour of the latter. So are we; Westminster Bridge is a weak though rather elegant design, and we have no wish to see anything of the same type repeated. The sketch for the granite and concrete bridge indicates at present some of the same features which we have disliked in the original Vauxhall Bridge design; the course of very heavily rusticated voussoirs, for instance, which serves to exaggerate the thinness of the arch at the crown; and the sketch for the piers appears to present one of those large columnar appendages which we always dread the sight of; but it is understood that these are merely drawings to show different classes of bridge, and that the details of the design may be entirely modified in execution; and the County Council seem at last to have had the conclusion hammered into them that some special architectural assistance is desirable in designing a bridge, unless where the simple and unadorned construction is left to speak for itself.

Electricity v. Steam.

MR. LANGDON'S paper, "On the Supersession of the Steam by the Electric Locomotive," attracted several railway managers and engineers to the meeting of the Institution of Electrical Engineers last week. As some misconception exists on this subject, it may be as well to premise that if ever electricity be adopted on existing lines, it will only be adopted gradually. There will be no sudden revolution, and little extra capital will be required. If, as electricians seem to be convinced, considerable economies can be effected by the displacement of the travelling generator by the stationary generator, the shareholders in railway companies need not be afraid that the gradual adoption of electricity will diminish their dividends. Mr. Langdon is the electrician to the Midland Railway, and in his paper he estimates the cost of working the Midland main line between St. Pancras and Bedford by electricity. He calculates that the direct saving effected on this portion of the line, after paying the interest on the increased capital outlay, would be nearly 200,000*l.* per annum. In making this estimate he took the average working expenses of this line for the last twenty-four years. If he had taken it for last year the saving would be much greater, owing to the great advance in the price of coal. Mr. Langdon treats the subject from the shareholders' point of view, but the working of all our railways by electricity would no doubt present advantages of other kinds; the

saving of three million tons of coal per annum, for instance, and the sanitary advantage of doing away with smoke and coal-dust. Mr. Cunningham, the manager of the Central London Railway, agreed generally with Mr. Langdon's figures, but thought that they were somewhat too favourable to the steam locomotive. Colonel Crompton, who has designed a large electric railway in Cashmere, said that his recent experiences in South Africa led him to the conclusion that the driver of a steam locomotive must be a much more highly trained and competent man than the driver of an electric locomotive. These however, are the opinions of those who would have a natural bias in favour of electrical power, and the other side of the question must not be forgotten. If Mr. Langdon's 600 volts as a working pressure were adopted, special precautions would have to be taken to prevent leakage currents from the rails causing damage to neighbouring property, not to speak of the danger to life in the cases of persons straying on the railway, which it is impossible entirely to prevent. The most serious question of all however, is, whether the substitution of a central power for a power carried by the locomotive itself would not interfere seriously with the elasticity of working of a great railway system. Central electrical power is all very well for a railway like the Central London, which merely runs passenger trains backwards and forwards all at the same speed and stopping at all stations; but when all kinds of trains, passenger and goods, are to be run at all kinds of speed, and complicated shunting operations have to be carried out, an engine with its own independent power, which can be driven about like a horse, must certainly have very distinct advantages in working the traffic.

Cantor Lectures.

Dr. Fleming gave the second of the Cantor Lectures to a crowded audience on Tuesday night. The subject was electrical resonance, and the lecturer illustrated it by many novel experiments. He first discussed the subject mathematically, and showed the method of calculating the period of an electrical oscillation. For his purpose he divided all oscillators into good electric radiators and bad electric radiators. With a good electric radiator like a charged sphere it was difficult to note the oscillations, as the charge died away so rapidly, but with a bad electric radiator, like a circuit containing capacity and inductance, the oscillations were persistent. He mentioned the difficulties electricians had in transmitting power through concentric mains owing to resonance effects, and showed an instrument for measuring the frequency which worked on this principle. Electrical resonance is analogous to resonance in sound. Just as gas globes, &c., sometimes respond to a note on a musical instrument, so a resonant electrical circuit is exceedingly sensitive to electric waves of a certain frequency. He illustrated this by putting a small lamp in series with a coil of wire and a Leyden jar, and showed how it became incandescent when electric waves fell on the circuit, a current of half an ampere apparently passing through the thick glass of the Leyden jar. He showed the nodes on two parallel wires when electric oscillations were set up in them, and so measured the wave length of these oscillations. He mentioned that by photographing the spark, so as to find the period of the oscillation, this enabled us to find the velocity of propagation of these waves, which is the same as the velocity of light, namely, 186,000 miles per second. He stated that optical absorption, and therefore the colour of bodies, was caused by electrical resonance. Dr. Fleming stated that Mr. Marconi had recently shown and explained to him some marvellous advances in wireless telegraphy. All the wireless telegraphic instruments used in the British Navy are tested between the Portsmouth and Portland stations, a distance of sixty-five miles, and through hills six or seven hundred feet high near Swanage. Marconi's stations are at Niton, in the Isle of Wight, and at Poole, a distance of thirty miles, so that the messages sent by Marconi and the Admiralty must cross one another apparently without interference. Marconi has succeeded in sending and receiving two messages simultaneously without the slightest sign of interference in the printed messages at the receiving station, several of which the lecturer showed. In Dr. Fleming's opinion there is a great future for not only wireless telegraphy, but also for wireless electric lighting and wireless transmission of power.

The Grafton Gallery.

It may be questioned whether "Romney exhibitions" are very good for Romney's fame, unless restricted to a small collection of his best works. Whatever Romney himself and his admirers may have thought, he was far behind "the man in Leicester-square" in variety of character and power of colour; and the present exhibition at the Grafton Gallery is, as a whole, a rather dull one, including a good many portraits which are heavy in character and deficient in interest. The large picture of "Newton Discovering the Prism" is very fine in conception, but the head of Newton gives rather too much the impression of having been, as it actually was, "painted from a cast taken after his death"; it has not the expression of life. Nor is "Shakespeare Nursed by Tragedy and Comedy" a picture to delight us much at the present day, however it may have suited the conventional taste of Romney's time. The most interesting of the works in the gallery are among those which are large sketches rather than finished pictures; "Lady Hamilton reading a gazette recording one of Nelson's victories" (23), for instance, and "Matilda, daughter of John Lockwood" (36), a half-length painted with a freedom and spirit very different from the heavy flat execution of many of the works exhibited. The portrait of "Charles, Second Earl Grey" (27) is exceptionally good in colour; and the large picture of "Lady Hamilton as a Bacchante leading a goat" (69), with the indication of a stormy landscape as a background, is one of the really fine things of the collection, which as a whole leads one to the conclusion that it is possible to have too much of Romney all at once, and that he is more favourably shown by individual pictures than by his collective work.

Mr. Arthur Hopkins's Exhibition.

At the Society of Fine Arts is a collection of water-colours by Mr. Arthur Hopkins which is certainly calculated to add to the reputation of this clever artist. Mr. Hopkins has chiefly been known as a painter of very well-executed scenes of rustic life of a popular character and not burdened with any very recondite sentiment; pictures which suit the general public and the illustrated papers. The majority of the works at the Fine Art Society are, however, pure landscape, and of a high order as such. It would be difficult to find a small landscape more perfect in its way than the heath scene entitled "Where the Bee Sucks" (49), and "The Singing Sands of Studland" (73) has excellence of the same kind; also "The Purple Moor" (3). Trees with a background of sea form the elements in other charming examples—"On the Top of the Cliff" (16), "Copper Beeches in Spring" (24), "The Edge of a Pinewood, Studland Bay" (37), &c. We note also the fine colour in the one entitled "Near Haslemere" (16), and in another way "Tudor House, Yaverland" (20) is a perfect little picture of an old country house. The larger work, "Bathing in the Surf" (18) showing a fine sea with two or three figures of young women in irreproachable bathing dresses, belongs to the artist's more usual class of work, as also "The Mermaids" (47); as usual in such pictures, the mermaid is much too human in physiognomy—a watering-place young lady with a fish-tail tacked on to her; if painters want to make one (momentarily) believe in a mermaid, they should give her a character and expression of her own, different from that of humanity. Pictures like this, however, are hardly to be taken quite seriously; but the landscapes are truly artistic work. "The Mowers" (10), a landscape with figures, is also admirable as a composition.

The Dutch Gallery.

Messrs. Van Wissenburgh have on view at their Gallery at 14, Brook-street a small collection of pictures, some of which are of what we call the "dingy school" of modern Dutch landscape, from which light and colour seem to be banished. "A Marine Sunset" by Dupré is, however, an impressive though gloomy work; there is a fine little "landscape study" by J. Maris, also a "nude study" by the same artist which has dignity and power; a figure-subject by Diaz, two fine flower-paintings by M. Fantin-Latour in his well-known style, and a view of Paris by A. Vollon, showing the Institut building on the left. M. Daumier's Don Quixote pictures are what we should call bad jokes. There are eight small Corots, of various degrees of interest; probably early works.

Jewellery and Metalwork Exhibition.

The Fine Art Society has on view a collection of very original jewellery and metalwork by Mr. and Mrs. Nelson Dawson. All the articles show an endeavour to import original thought into work of this class, and to give to each object an individual interest. Among the larger objects are an electric light standard (3) in bronze, silver, and marble, the marble forming the base, the bronze stalk terminating in a fawn's head; two or three wall sconces for candles or electric light, treated in grey steel or in brass, which are very good though exceedingly simple in design; fire-irons and other articles of the same class. In some cases simplicity is carried too far. We cannot see, for instance, the beauty of the "fender in brass and forged iron" (13) with the plain surface of the iron merely beaten into some

lumps or swellings here and there. Metal is not equally suitable, either, for all objects of household use—not for a fire-screen, for instance; it suggests the idea of getting heated, and in fact probably would get so, and therefore does not properly fulfil the purpose of a screen; and this one in fact (33) really rather suggests a dinner-gong in appearance. Among the jewellery designs are many charming and original things; we may mention especially the necklet in gold with enamel (104), bracelet in pearl, enamel and beaten gold (132), cloak clasps in beaten silver with carbuncles (133), the necklets numbered 180 and 185, the necklet of Egyptian mummy beads with gold ornaments introduced (172)—the modern gold ornaments with which the long beads are "sandwiched" are singularly delicate and pretty; and a bag in gold brocade with a silver and *cloissonné* enamel medallion on it is quite admirable. We do not like imitation insects for ornament, such as Nos. 131 and 152; and we may observe also that an article for use, even in the shape of jewellery, should not be too fragile; such an object as the "Pin in gold with spinel ruby" (151), though it looks very pretty, suggests the idea that it would be very difficult to push it into anything without injurying or crushing the little bars which form a kind of cage for the ruby. But there is much beautiful work here, and there is what may be called a better tone about it than about French jewellery; it is more simple and less pretentious in taste.

THE SURVEYORS' INSTITUTION:

COVERED SHEDS FOR FARMYARD PURPOSES.

THE following paper, as announced in our last issue, was read at a meeting of the Surveyors' Institution on the 26th ult. by Mr. A. T. Walmisley:—

"The arrangement of improved farm homesteads and their influence upon agricultural prosperity was ably dealt with, in a paper read by Mr. A. Dudley Clarke, F.S.I., at a meeting of the Surveyors' Institution in January, 1883, which was followed by a useful supplementary paper contributed by Mr. C. John Mann, F.S.I., and published in the 'Transactions.' In the discussion which followed, the advantages of covered yards were thus summed up: In the first place, they were economical; secondly, stock never did so well as under buildings where they were protected from the elements, provided care was taken to turn the stock out in the spring and summer to avoid making the stock delicate; and thirdly, that one load of cake-fed manure stored under a covered yard was equal to three or four loads kept in an uncovered yard. All agreed that the approach to covered yards for the protection of stock during 'feeding time' and during inclement weather should approximately face the south, so as to obtain a maximum of sun and of air with a minimum of exposure, but that in the case of sheds for machinery and for implements the open end should be turned towards some shelter. The Chairman stated that many points had been raised upon which there existed differences of opinion, and that such points admitted of an extended discussion.

The present paper does not pretend to arrive at any definite conclusions so far as arrangement of farm buildings is concerned, but to touch upon a few considerations of details of structures. Farming practice differs so much that buildings which would be really needed in one district or upon an individual farm might be entirely out of place in another. Farmyard buildings are indispensable aids to farming practice, but in the midst of the present financial difficulties which embarrass agricultural interests, it is questionable how far the erection of very substantial farm buildings is now justified, as it is impossible to foresee what changes of occupation may take place in the future, which would render them more or less useless. Elaborate and expensive structures do not add, except in a minor degree, to the actual productive capacity of a farm. As regards implements, arable farms of a given acreage require more storage for implements than pastoral farms of the same extent.

The design or shape of any building or structure for farm requirements may assume almost any form, depending not only upon the stability of the structure, but mainly on its situation and requirements, so that very little of a general nature can be said on this point. Many farmers advocate an open yard with sheds round it for storing cattle, as they consider that although there is a small waste in the manure, the cattle thrive better and are more healthy when turned out in the open as much as possible. Other more up-to-date farmers insist that the animals kept under cover in a shed, free from draught and amply ventilated, and built over a non-absorbent floor, are fatted quicker and at less cost than those exposed to weather. The manure made is also of greater value, as it is not exposed to the rain, which washes a large proportion of the valuable manurial constituents away. In open yards a suitable covering for a manure pit would consist of a rectangular enclosure surrounded by a wall of 3 ft. or 4 ft. high, except in the centre at one end, as shown in the fig. 5, and surmounted by a painted corrugated iron roof, supported on H section stanchions standing 10 ft. high from ground to eaves, so as to leave the upper portions of the ends and sides over this wall open, and provided with all necessary wrought-iron tie-rods, gutters, down-pipes, and fastenings. Exclusive of foundations and brickwork, the price delivered ready for erection is about 1s. 5d. per ft. super of area covered.

The most suitable materials for farm buildings depend upon local circumstances. Too much stress can scarcely be laid upon the proper location of manure pits and also upon the efficient drainage arrangements of all sheds. It is of primary importance to ascertain the various materials most accessible and the best that can be obtained in the district of the proposed structures, whether bricks, stone, cement, slates, tiles, timber, concrete, or iron, having regard also to the distance and convenience of carriage and the selection of the time most agreeable to the tenant, if, as is generally the case, he is to do the transport. Where bricks are reasonable in price and of near carriage, 9-in. brick walls upon proper footings with piers 14 in. wide under the principals are well adapted for single-story buildings. Concrete walls are well done in some parts, care being taken that the gravel or sand mixed with the cement is free from loam or clayey material. In a stone country a good rough rubble wall with drafted stone quoins, if the stone can be easily dressed, or otherwise with brick quoins, may be recommended, or where neither suitable stone nor brick are procurable, concrete may be used, either placed *in situ* in a plastic condition between timber sheeting and subsequently rendered in cement for the sake of appearance upon the removal of the boards, or the concrete may be cast in blocks, and these blocks built up like ashlar. For floors of any outbuilding concrete is more suitable than flagstone, as joints in flags frequently become washed out. Flagstones crack, and the cavities so formed become depositories for filth which no broom can clear. Weather-boarded buildings well tarred, upon brick bases, carried about 2 ft. above the ground, are inexpensive in some places, and make satisfactory enclosures. Fig. 7 shows an outside covering resting upon four courses of brickwork, viz., a bottom course of 18 in. width, the next course 14 in. wide, both below the ground level, and a double course of 9-in. work above the ground level. In the case of a corrugated iron covering at the sides of the building, a galvanised iron flashing piece is indicated to be fixed around the bottom timber plate, which flashing runs up about 2 in. behind the iron sheets and returns over the top 9-in. brick course. A damp course can also be added by a layer of felt placed between the timber plate and brickwork below the floor level. Air bricks can also be built at suitable intervals in the upper portion of the footings.

A cheaper plan is to carry the building upon iron base pillars, as shown in fig. 6, placed 9 ft. centres and to omit the brickwork footings. By carrying these pillars up to a height clear of the ground a store can be built with a strong floor, vermin proof. The price for a shed 25 ft. by 15 ft., suitable for a grain store, 8 ft. to eaves and 12 ft. to apex of roof, constructed on vermin-proof pillars, would be about 2s. 6d. per square foot of area covered.

For corrugated iron work, self-supporting structures are, for sake of economy, introduced. Trusses are dispensed with in curved roofs up to 30 ft. span, the sheets alone with light bracing being sufficient. Its form gives it strength, and allows it to be fixed in a minimum time. Up to 20 ft. span (fig. 1) a single tie-rod, slung up at the centre, is generally employed, the sheets being curved to the required radius and maintained in position simply by tie and king rods spaced about 10 ft. apart. In spans of 20 to 24 ft. (fig. 2) the single vertical central rod is removed and angle iron struts with their ends bent round for connexions are substituted. Comparatively heavier gauge sheets are introduced, and wall plates added along the eaves to carry the sheets. In spans of 24 to 30 ft. the vertical central sling rod is added, as shown in fig. 3, thus forming a kind of half-way design between an ordinary principal roof and the curved self-supporting roof described above. Above this span principals and purlin bars need to be introduced so as to form a complete framework on which to secure the sheets.

A shed designed by the author shown in elevation in fig. 16* is furnished with a strong form of roof, 30 ft. span, suitable for an exposed situation. Fig. 17 gives a plan with position of wind ties and sliding doors, the elevation of the sliding-doors and enlarged details of their connexions being given in fig. 18. The half elevation of roof principal and the half span in elevation of the end principal or screen end covered with corrugated iron carried on angle iron bracing, are furnished respectively by figures 19 and 20. Details are also shown of the side framing, struts, tie-rods, and forgings. Where circumstances admit of the expense in a farm building this structure provides a substantial enclosure of convenient size but where expenditure is an object, a roof at less cost than the corrugated iron roof above described can be built with curved timber trusses for 50 ft. span, such as that in fig. 21, can be easily erected on the following lines. Rise, 7 ft. Depth of truss at centre, 5 ft. Curved roof boarding, 36 ft. 6½ in. radius. Radius of curve to tie-beam, 46 ft. 10 in. Rafter of tie-beam, composed of battens 7 in. by 1½ in. and 6 ft. long, fixed side by side, butt joints made by two battens occurring in the centre of the adjoining batten. Diagonal bracing, 2½ in. by 1¼ in., with packing pieces at intersections. Two vertical struts, spaced equidistant, composed of 5 in. by ¾ in. battens. Purlins, 3 in. by 2 in., and 3 ft. apart (centres). Roof boarding, ¾ in. thick (to a curve as above). V gutter, 9 in. by 9 in. by 1 in. Wall-plate, 9 in. by 3 in. Principals at 7 ft. 6 in. centres, supported on wood standards with intermediate bracing.

For the sake of comparison, fig. 22 has three timber queen post truss roofs of 27 ft. 9 in., 36 ft., and 26 ft. 3 in. spans respectively, and fig. 32 shows corrugated iron roofs suitable for 40 and 20 ft. spans in exposed situations. The limits of time allowed for this paper do not permit me to do more than to present them as examples of actual work, but I shall be happy to reply to any questions that may arise in the discussion connected therewith.

The cheapest shed that can be erected consists of timber framing to sides and ends carrying a self-supporting covering. Where timber rafters are introduced, with longitudinal battens fairly close together, from rafter to rafter, the usual bolt connexions in the side laps are frequently dispensed with, the corrugated iron as a weather covering being simply nailed to the battens and a ridge capping added. The cost of the necessary timber framing for such roofs, the rafters 5 in. by 3 in. having collar braces and 2 ft. 6 in. apart with wall plates 4½ in. by 4½ in., the battens being 3 in. by 1½ in., would be about 6d. per square foot of area covered. Fig 32 show a comparison between a slated and a zinc roof, and illustrates a corrugated iron self-supporting roof, each covering an area of 100 ft. by 25 ft., the slate roof costing about 1s. 1d., the zinc roof 10½d., and the corrugated iron roof 7¼d. per square foot of area covered.

Where zinc is employed it is of great importance that the zinc should be pure. If it contain any iron it will not satisfactorily resist the atmospheric influences, and when placed in direct contact with brickwork has, under certain conditions, been found to suffer corrosion.

* For figs. 16 to 20 see sheet ii. of diagrams, pp. 516, 517.

saving of three million tons of coal per annum, for instance, and the sanitary advantage of doing away with smoke and coal-dust. Mr. Cunningham, the manager of the Central London Railway, agreed generally with Mr. Langdon's figures, but thought that they were somewhat too favourable to the steam locomotive. Colonel Crompton, who has designed a large electric railway in Cashmere, said that his recent experiences in South Africa led him to the conclusion that the driver of a steam locomotive must be a much more highly trained and competent man than the driver of an electric locomotive. These however, are the opinions of those who would have a natural bias in favour of electrical power, and the other side of the question must not be forgotten. If Mr. Langdon's 600 volts as a working pressure were adopted, special precautions would have to be taken to prevent leakage currents from the rails causing damage to neighbouring property, not to speak of the danger to life in the cases of persons straying on the railway, which it is impossible entirely to prevent. The most serious question of all however, is, whether the substitution of a central power for a power carried by the locomotive itself would not interfere seriously with the elasticity of working of a great railway system. Central electrical power is all very well for a railway like the Central London, which merely runs passenger trains backwards and forwards all at the same speed and stopping at all stations; but when all kinds of trains, passenger and goods, are to be run at all kinds of speed, and complicated shunting operations have to be carried out, an engine with its own independent power, which can be driven about like a horse, must certainly have very distinct advantages in working the traffic.

Cantor Lectures.

Dr. Fleming gave the second of the Cantor Lectures to a crowded audience on Tuesday night. The subject was electrical resonance, and the lecturer illustrated it by many novel experiments. He first discussed the subject mathematically, and showed the method of calculating the period of an electrical oscillation. For his purpose he divided all oscillators into good electric radiators and bad electric radiators. With a good electric radiator like a charged sphere it was difficult to note the oscillations, as the charge died away so rapidly, but with a bad electric radiator, like a circuit containing capacity and inductance, the oscillations were persistent. He mentioned the difficulties electricians had in transmitting power through concentric mains owing to resonance effects, and showed an instrument for measuring the frequency which worked on this principle. Electrical resonance is analogous to resonance in sound. Just as gas globes, &c., sometimes respond to a note on a musical instrument, so a resonant electrical circuit is exceedingly sensitive to electric waves of a certain frequency. He illustrated this by putting a small lamp in series with a coil of wire and a Leyden jar, and showed how it became incandescent when electric waves fell on the circuit, a current of half an ampere apparently passing through the thick glass of the Leyden jar. He showed the nodes on two parallel wires when electric oscillations were set up in them, and so measured the wave length of these oscillations. He mentioned that by photographing the spark, so as to find the period of the oscillation, this enabled us to find the velocity of propagation of these waves, which is the same as the velocity of light, namely, 186,000 miles per second. He stated that optical absorption, and therefore the colour of bodies, was caused by electrical resonance. Dr. Fleming stated that Mr. Marconi had recently shown and explained to him some marvellous advances in wireless telegraphy. All the wireless telegraphic instruments used in the British Navy are tested between the Portsmouth and Portland stations, a distance of sixty-five miles, and through hills six or seven hundred feet high near Swanage. Marconi's stations are at Niton, in the Isle of Wight, and at Poole, a distance of thirty miles, so that the messages sent by Marconi and the Admiralty must cross one another apparently without interference. Marconi has succeeded in sending and receiving two messages simultaneously without the slightest sign of interference in the printed messages at the receiving station, several of which the lecturer showed. In Dr. Fleming's opinion there is a great future for not only wireless telegraphy, but also for wireless electric lighting and wireless transmission of power.

The Grafton Gallery.

It may be questioned whether "Romney exhibitions" are very good for Romney's fame, unless restricted to a small collection of his best works. Whatever Romney himself and his admirers may have thought, he was far behind "the man in Leicester-square" in variety of character and power of colour; and the present exhibition at the Grafton Gallery is, as a whole, a rather dull one, including a good many portraits which are heavy in character and deficient in interest. The large picture of "Newton Discovering the Prism" is very fine in conception, but the head of Newton gives rather too much the impression of having been, as it actually was, "painted from a cast taken after his death"; it has not the expression of life. Nor is "Shakespeare Nursed by Tragedy and Comedy" a picture to delight us much at the present day, however it may have suited the conventional taste of Romney's time. The most interesting of the works in the gallery are among those which are large sketches rather than finished pictures; "Lady Hamilton reading a gazette recording one of Nelson's victories" (23), for instance, and "Matilda, daughter of John Lockwood" (36), a half-length painted with a freedom and spirit very different from the heavy flat execution of many of the works exhibited. The portrait of "Charles, Second Earl Grey" (27) is exceptionally good in colour; and the large picture of "Lady Hamilton as a Bacchante leading a goat" (69), with the indication of a stormy landscape as a background, is one of the really fine things of the collection, which as a whole leads one to the conclusion that it is possible to have too much of Romney all at once, and that he is more favourably shown by individual pictures than by his collective work.

Mr. Arthur Hopkins's Exhibition.

At the Society of Fine Arts is a collection of water-colours by Mr. Arthur Hopkins which is certainly calculated to add to the reputation of this clever artist. Mr. Hopkins has chiefly been known as a painter of very well-executed scenes of rustic life of a popular character and not burdened with any very recondite sentiment; pictures which suit the general public and the illustrated papers. The majority of the works at the Fine Art Society are, however, pure landscape, and of a high order as such. It would be difficult to find a small landscape more perfect in its way than the heath scene entitled "Where the Bee Sucks" (49), and "The Singing Sands of Studland" (73) has excellence of the same kind; also "The Purple Moor" (3). Trees with a background of sea form the elements in other charming examples—"On the Top of the Cliff" (16), "Copper Beeches in Spring" (24), "The Edge of a Pinewood, Studland Bay" (37), &c. We note also the fine colour in the one entitled "Near Haslemere" (16), and in another way "Tudor House, Yaverland" (20) is a perfect little picture of an old country house. The larger work, "Bathing in the Surf" (18) showing a fine sea with two or three figures of young women in irreproachable bathing dresses, belongs to the artist's more usual class of work, as also "The Mermaids" (42), as usual in such pictures, the mermaid is much too human in physiognomy—a watering-place young lady with a fish-tail tacked on to her; if painters want to make one (momentarily) believe in a mermaid, they should give her a character and expression of her own, different from that of humanity. Pictures like this, however, are hardly to be taken quite seriously; but the landscapes are truly artistic work. "The Mowers" (10), a landscape with figures, is also admirable as a composition.

The Dutch Gallery.

Messrs. Van Wissenburgh have on view at their Gallery at 14, Brook-street a small collection of pictures, some of which are of what we call the "dingy school" of modern Dutch landscape, from which light and colour seem to be banished. "A Marine Sunset" by Dupré is, however, an impressive though gloomy work; there is a fine little "landscape study" by J. Maris, also a "nude study" by the same artist which has dignity and power; a figure-subject by Diaz, two fine flower-paintings by M. Fantin-Latour in his well-known style, and a view of Paris by A. Vollon, showing the Institut building on the left. M. Daumier's Don Quixote pictures are what we should call bad jokes. There are eight small Corots, of various degrees of interest; probably early works.

Jewellery and Metalwork Exhibition.

The Fine Art Society has on view a collection of very original jewellery and metalwork by Mr. and Mrs. Nelson Dawson. All the articles show an endeavour to import original thought into work of this class, and to give to each object an individual interest. Among the larger objects are an electric light standard (3) in bronze, silver, and marble, the marble forming the base, the bronze stalk terminating in a fawn's head; two or three wall sconces for candles or electric light, treated in grey steel or in brass, which are very good though exceedingly simple in design; fire-irons and other articles of the same class. In some cases simplicity is carried too far. We cannot see, for instance, the beauty of the "fender in brass and forged iron" (13) with the plain surface of the iron merely beaten into some

lumps or swellings here and there. Metal is not equally suitable, either, for all objects of household use—not for a fire-screen, for instance; it suggests the idea of getting heated, and in fact probably would get so, and therefore does not properly fulfil the purpose of a screen; and this one in fact (33) really rather suggests a dinner-gong in appearance. Among the jewellery designs are many charming and original things; we may mention especially the necklet in gold with enamel (104), bracelet in pearl, enamel and beaten gold (132), cloak clasps in beaten silver with carbuncles (133), the necklets numbered 180 and 185, the necklet of Egyptian mummy beads with gold ornaments introduced (172)—the modern gold ornaments with which the long beads are "sandwiched" are singularly delicate and pretty; and a bag in gold brocade with a silver and *cloissonné* enamel medallion on it is quite admirable. We do not like imitation insects for ornament, such as Nos. 131 and 152; and we may observe also that an article for use, even in the shape of jewellery, should not be too fragile; such an object as the "Pin in gold with spinel ruby" (151), though it looks very pretty, suggests the idea that it would be very difficult to push it into anything without injurying or crushing the little bars which form a kind of cage for the ruby. But there is much beautiful work here, and there is what may be called a better tone about it than about French jewellery; it is more simple and less pretentious in taste.

THE SURVEYORS' INSTITUTION:

COVERED SHEDS FOR FARMYARD PURPOSES.

THE following paper, as announced in our last issue, was read at a meeting of the Surveyors' Institution on the 26th ult. by Mr. A. T. Walmisley:—

"The arrangement of improved farm homesteads and their influence upon agricultural prosperity was ably dealt with, in a paper read by Mr. A. Dudley Clarke, F.S.I., at a meeting of the Surveyors' Institution in January, 1883, which was followed by a useful supplementary paper contributed by Mr. C. John Mann, F.S.I., and published in the 'Transactions.' In the discussion which followed, the advantages of covered yards were thus summed up: In the first place, they were economical; secondly, stock never did so well as under buildings where they were protected from the elements, provided care was taken to turn the stock out in the spring and summer to avoid making the stock delicate; and thirdly, that one load of cake-fed manure stored under a covered yard was equal to three or four loads kept in an uncovered yard. All agreed that the approach to covered yards for the protection of stock during 'feeding time' and during inclement weather should approximately face the south, so as to obtain a maximum of sun and of air with a minimum of exposure, but that in the case of sheds for machinery and for implements the open end should be turned towards some shelter. The Chairman stated that many points had been raised upon which there existed differences of opinion, and that such points admitted of an extended discussion.

The present paper does not pretend to arrive at any definite conclusions so far as arrangement of farm buildings is concerned, but to touch upon a few considerations of details of structures. Farming practice differs so much that buildings which would be really needed in one district or upon an individual farm might be entirely out of place in another. Farmyard buildings are indispensable aids to farming practice, but in the midst of the present financial difficulties which embarrass agricultural interests, it is questionable how far the erection of very substantial farm buildings is now justified, as it is impossible to foresee what changes of occupation may take place in the future, which would render them more or less useless. Elaborate and expensive structures do not add, except in a minor degree, to the actual productive capacity of a farm. As regards implements, arable farms of a given acreage require more storage for implements than pastoral farms of the same extent.

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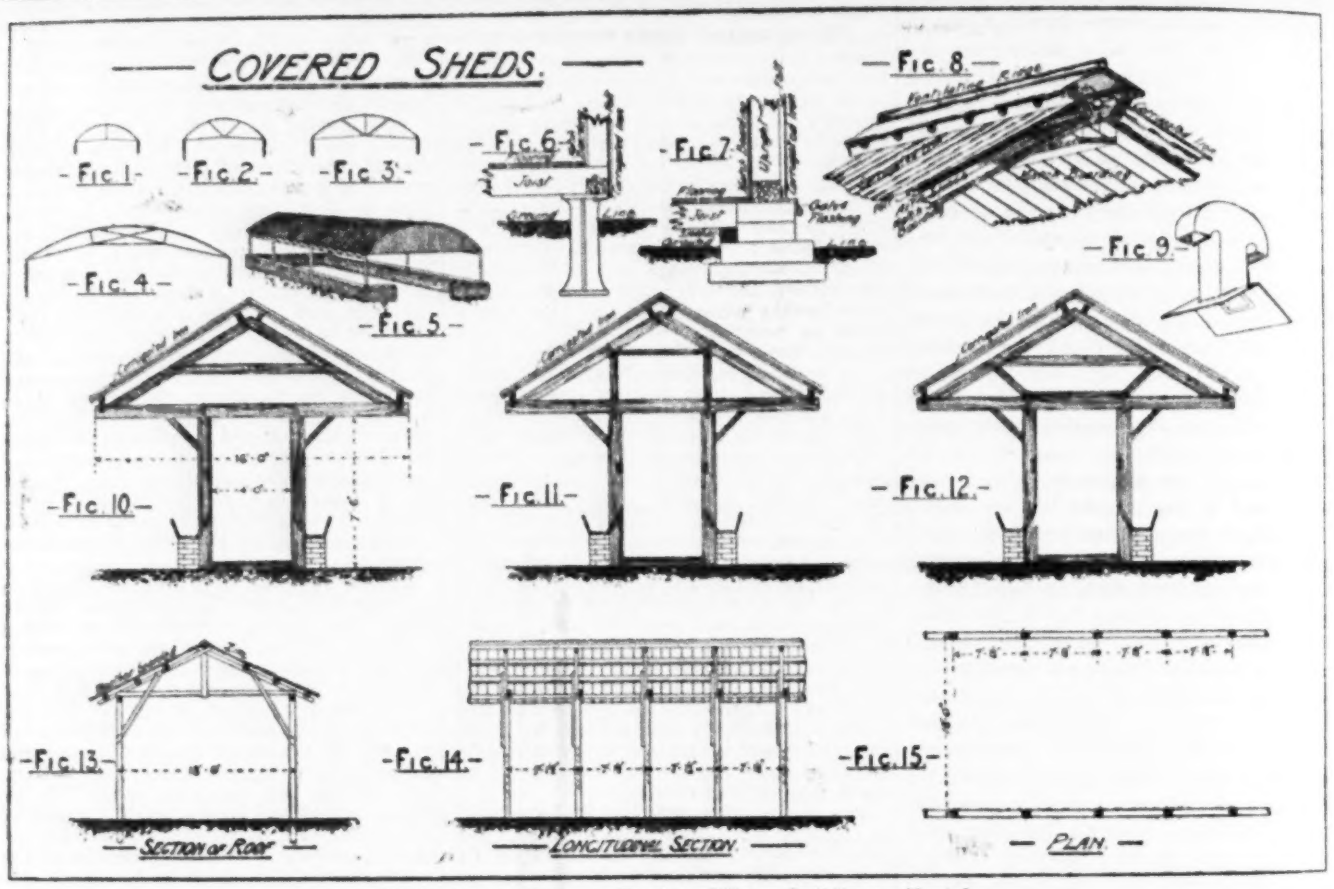


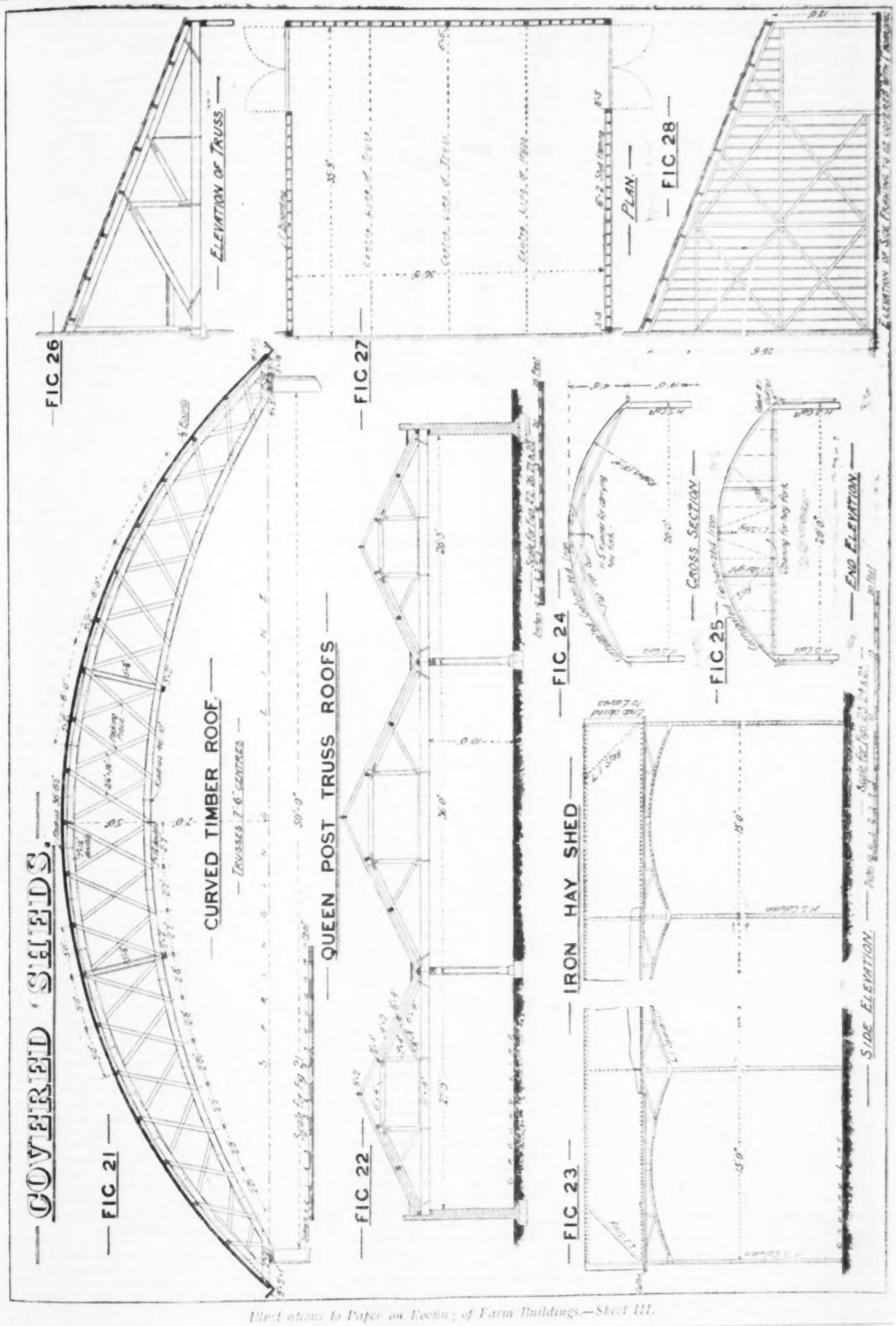
Illustrations to Paper on Roofing of Farm Buildings.—Sheet I.

In Berlin a portion of zinc supported on a brick wall in the city market-hall was reported to have become pitted, and subsequent chemical examination of the bricks showed they contained a percentage of soluble salts which became acted upon by moisture in the atmosphere. Ordinary corrugated zinc cannot be recommended. For roofs of a permanent character either No. 14, No. 15, or No. 16 gauge should be used in the case of zinc, and either 18 B.W.G., 20 B. W. G., or 22 B.W.G. in the case of corrugated iron. The weight of the corrugated iron (22 B.W.G) in the case of the shed shown in fig. 32, 25 ft. span, would be about 2 tons, exclusive of bracing. Good iron well galvanised, or ungalvanised and painted if near the sea, will last longer than thicker sheets of inferior quality, and with regard to thin sheets of zinc it must be remembered that a surface crack allows the commencement of deterioration. It is an erroneous idea that iron buildings do not last for any length of time. With proper treatment and periodical coats of paint, say every three years, these structures can be preserved thirty to forty years. Where exposed to acid or alkaline fumes, such as is occasionally the case in the immediate neighbourhood of covers to fold yards or dung steads, the galvanising may quickly deteriorate, and when once the galvanising is broken through the sheet quickly becomes perforated, whatever the thickness of gauge may be. A covering of copper sheets in such situations is preferable. The best protection under such circumstances for corrugated iron is to coat the sheets with good red lead paint or even a composition of pitch and tar, a month or two after they have been erected, and to repeat this coating as necessary—probably every three or five years. The reason for delaying the application of this covering until after the erection is completed, is to allow the sheets to become tarnished upon the surface, since they will then allow the paint to adhere more firmly than when it is applied to a fresh metallic surface, and the whole area becomes covered without risk of further openings being made for connexions. When, for the sake of economy, galvanised sheets are used it must be remembered that while the galvanising process protects the iron from corrosion, it also tends to render the iron brittle. Notwithstanding this fact, the author is acquainted with a corrugated galvanised iron covering which stood over the large area of the Borough Market, Southwark, for thirty years, when it was found to be completely riddled in holes, and taken down as being dangerous owing to the vibrations communicated from the railway viaducts which carried the roof framework.

The value of the galvanised sheets employed for coverings mainly depends upon the quality of the iron. Although a certain excellence of quality is essential to allow the rolling of comparatively thin sheets which shall be able to endure the corrugation required without risk of damage, yet it will be found upon examination that large quantities of inferior sheets are sold in the market which have minute cracks or a blistered surface. Sheets of this character will not hold the spelter properly, or if ungalvanised and painted the smallest flaw in the continuity of covering gives an entrance for the weather, with a serious result. Rust from the exposed spot spreads laterally under the covering, and when the rust separates from the iron the paint comes off with it. Charcoal sheets for galvanising are not an ordinary article of commerce. The sheets sold by manufacturers at extra prices for galvanising and other purposes under the name of "charcoal sheets" are generally made of steel.

Figs. 23, 24, and 25 illustrate a hay-shed with a corrugated iron roof 20 ft. wide constructed in 15 ft. bays. The shed is 14 ft. high at the eaves, and the curved roof has a rise of 4 ft. 6 in. The intermediate framing of the roof, as shown in the cross-section (fig. 24), is formed of angle-iron rafters with flat iron tie-bars. They are partly riveted together at the maker's yard, and are provided with a necessary shoe and splicing plates. The roof is carried on H steel columns, spaced 15 ft. centres, and special attention needs to be paid to the connexions between the column heads and the roof framing. This form of stanchion is the best to adopt, where the columns are liable to be knocked against by carts or the like. Where possible, they should be let in from 1 ft. to 2 ft. into solid concrete blocks bedded in the ground, and spur stones added. In the case under review the columns have angle bases riveted on to their feet, for anchorage into the concrete foundation. In each bay, between the heads of columns, there is a light lattice girder formed of angle-iron eaves bar, and spandril with flat iron bracing all riveted together, including the necessary splicing plates on the columns. The end frames shown in the end elevation are formed of angle-iron rafters, tie-bar, and uprights, with the necessary shoe and splicing plates, and have a stay of angle iron from the tie-bar to the crown of the roof, as shown in the side elevation (fig. 23). The roof in this case is covered with Braby's No. 22 W.G. best "Empress" brand galvanised corrugated sheets, laid with 6-in. end laps and one corrugation side lap, fixed to the eaves bar with clips, and to the crown bar with hook bolts, and bolted to each other by means of sheet bolts all provided with galvanised material and lead washers. Angle-iron crown purlins extend from end to end of the roof, secured to the crown of the gables by means of splicing plates. Galvanised half-round wrought-iron eaves gutter is fixed along each side with gutter hooks spaced every 3 ft. Galvanised wrought-iron down-pipes secured to the stanchions by galvanised iron clips are added but it will be noticed that their ends are left free to avoid connexions to the underground drains. The ends of the shed can be clad with vertical corrugated sheets similar to the roof. Gutters and down pipes should be of ample size to facilitate clearance, and the top of a down pipe should be provided with guards to prevent choking by leaves and dirt. When not galvanised they are usually formed in cast iron, since this material, as a rule, will better resist corrosion from the greater body of thickness in a casting compared with thin wrought iron or steel gutters and down-pipes. An open shed as described above could be erected for about 1s. 5d. per square foot of ground covered. If side sheeting be necessary, the price to include covering the sides down to a depth of 4 ft. below the eaves would be an addition of about 2s. 3½d. per foot run of covering.

With hay and corn sheds head room is a consideration, hence the adoption of trusses with a raised tie-beam, as in fig. 4. But in many cases they are braced, as in fig. 32, and covered with corrugated iron, carried at the eaves on a wall plate, which may be of timber or of iron. For hay-sheds it is always advisable to have the framework entirely of iron or steel, as, in case of fire, the damage done will not be so considerable as if part of the framing were of timber. As regards the facilities of erection, a light pole, a ladder, and a few planks, with a rope and tackle, are about all that it is needful for a purchaser to provide. The required framework being riveted together prior to delivery, the chief labour in the erection lies in fixing the covering, for which it is important to employ an experienced sheeter; but the handy labourers usually employed about farmhouses could erect the remainder of the structure complete. Such



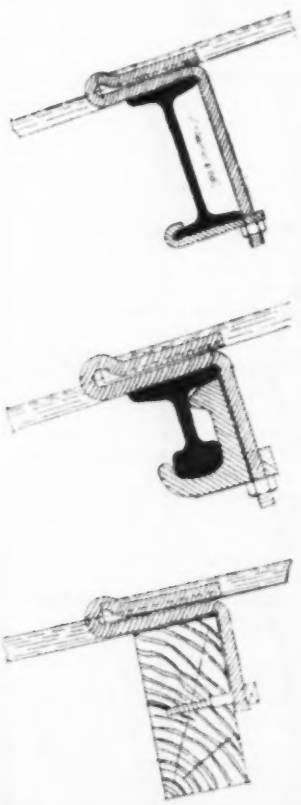
Illustrations to Paper on Roofing of Farm Buildings.—Sheet III.

sheds are extremely useful for other purposes than storing hay, in parts of the country where there is any difficulty in obtaining brick or stone for building purposes. For instance, a shed, such as that shown in figs. 23 to 25, could be used as cattle shelters and feeding sheds by placing troughs along one side and putting the necessary railings between the columns, with gates to allow of ingress and egress. They could also be used as cart or implement sheds when lighted by side windows. The hay sheds are sometimes fitted up with a carrier to take an American hay fork, as shown on the diagram, the ends of the shed being suitably framed to allow of a bundle of hay and the fork passing through without any obstruction. The carrier is formed of steel of H section, and is hung from the top by brackets, and

stayed between each of the couples by means of flat iron sway bars, the hay fork running on the bottom flanges of the H steel carrier. The price of a carrier delivered and erected adds 3s. per foot run to the cost of the shed.

Fig. 29 shows a simple arrangement for a coach house and stable, 40 ft. by 13 ft., costing 95*l.* fixed, or 3s. 8d. per square foot of ground space. Fig. 30 shows a shelter for forty-six cattle, erected by Messrs. John Lysaght, Limited. It covers a space 80 ft. by 33 ft., and is a particularly cheap class of building erected upon timber uprights, without rafters or purlins and costs 190*l.* fixed or about 1s. 5d. per square foot.

The corrugated iron sheet fittings designed by Mr. C. Thomas, consisting of saddles with concave washers to fit the corrugations as shown in fig. 31, can be applied to angle iron purlins or to joists, or to tee-shaped bars as required, and are supplied to order by The Metal Agencies Company, Limited, Queen-square, Bristol. Their use is calculated to overcome the leakage around the hook bolts sometimes introduced in the connexions, and to reduce to a minimum the dropping of condensation, by the saddle raising the corrugated sheet to the extent of about a quarter of an inch off the purlin, and so preventing the interception of the condensation by the purlin as in the old method. It will be observed that the metal saddle employed has a raised boss around the hole through which the hook bolt passes, and when the outside nut of the hook bolt is screwed down, the burr of the punched hole in the sheet is pressed into a concave washer and the corrugated iron sheet becomes embossed around the hook bolt without distorting the sheets to an extent likely to lead to leakage. The saddle also contributes to the action of a lock nut, thus reducing the liability of the nut of the hook bolt to work loose through vibration; and the condensation, instead of dropping under each purlin from one end of the building to the other, is conducted uninterruptedly to the eaves, rendering the centre of the floor dry.



The "Windle" Patent Clip (designed to overcome the difficulty, in corrugated iron roofs, of keeping the joints from leaking through the bolt-holes).

Where possible, all lighting should be obtained from the sides or ends of a building enclosed at the sides and ends, as roof lights, besides being somewhat costly, are apt to leak during wet and stormy weather.

Ventilation may generally be arranged mainly under the level of the eaves, only a limited amount (if any) being required in the roof itself. Nothing can be worse than a draught, especially a cross draught induced by too large openings in the ends and at the sides of a building. Ventilation is needed above and not across a yard. The usual louvre ventilators seen in the roofs of railway stations admit snow in winter. By raising the covering at its junction over an intermediate purlin in wide sheds and adding a pile plate or ridge piece above an upper purlin, effective ventilation is evenly distributed along the whole length of the roof in lieu of the ordinary louvre board arrangement. Fig. 8 shows a system which can be recommended in truss roofs. A ventilating ridge is provided by the introduction of 4 in. by 2 in. woodwork, perforated and running the whole length of the ridge both sides, but there are very few roofs of farm buildings that provide a double roof to admit of this means of ventilation, and with self-supporting roofs it would be only practical and safe to provide a number of small ventilators at prescribed intervals along the ridge. Of course, with ridged framed roofs any amount of ridge ventilation can be given, either continuously, or by means of small independent ventilators at intervals. The double-horned ventilators shown in fig. 9 are absolutely weather-proof, and can be readily attached to either curved or ridged roofs. The prices are 40s. with 18-in. shaft, and 25s. with 12-in. shaft.

Strong winds or gales should be specially taken into account in all buildings standing exposed to their action, and extra precautions adopted to prevent the force of such gales getting under the roof, since the majority of accidents to light self-supporting roofs are due to the lifting tendency of wind having free play underneath them, without being able to escape. In designing roofs it is sufficient for ordinary purposes to assume that there may be a lateral wind pressure of 28 lbs. per square foot and a weight of snow equal to 5 lbs. per square foot. These, added to the weight of the structure, give the total load to be sustained, and the working strain upon the material employed under such circumstances should be about one-fourth, and should never exceed one-third of the calculated breaking strain. Wrought iron of from 20 to 22 tons per square inch ultimate breaking strain is a fair assumption. To specify a higher unit breaking strain, is to invite a manufacturer to deliver mild steel, which for such very light sections as here needed would not be expedient.

Continual progress is being made in the application of iron and steel to building purposes, and the demand for structures of these materials increases. This is not surprising when we consider the advantage which iron and steel possess, in allowing a building to be sent to the place of erection complete and ready for fixing, in the small extent of ground surface taken up by walls and partitions, in their imperviability to moisture, and the practicability of rendering a building fire-resisting though not fireproof, and also in the ease with which a complete and thorough ventilation of a building can be arranged, and in the facility of removal and comparatively small cost of reconstruction in any other part of the farm.

Rectangular buildings may be covered with roofs having gabled ends, or the ends may be hipped. The hipped portion is, however, more expensive than the ordinary parts of a roof, the framework requiring more labour, and the covering is greatly cut to waste. As an approximate rule, one-third should be added to the general price per square of 100 superficial feet for that portion of the area which is covered by the hip. Against this extra, however, we have to consider the saving effected in the material that would be needed if gables were used. By simplicity of construction expense may be saved. Smith's work should be reduced to a minimum, and welding both at the joints and other paris avoided as much as possible. So far as the site will permit, a roof should be arranged to contain a repetition of parts, as upon the extent to which this is effected the cost so much depends. A building divided into equal spaces, and in which the principals occur at regular intervals, is the cheapest that can be adopted.

It is evident that expense may be saved by preserving as far as possible all existing buildings and making use of the existing walls, also by roofing in considerable areas in a block so as to subdivide the interior by light and inexpensive partitions with a view to facilitate subsequent alterations and save the cost of numerous outside walls. This affords opportunities for an advantageous disposition of material in unbraced structures, as it admits of introducing the nave and transept principle by placing the direction of one portion of the covering at right angles to the remainder. The use of expanded metal in concrete may be advantageously introduced in wide spans of roofing or partition.

While the limited amount of framework needed for corrugated iron recommends it for rapidity of erection at moderate cost, it is sometimes objected to as a covering because it does not moderate the extremes of heat and cold, and the interior of such buildings is consequently easily affected by changes of temperature. A double roof is the best means of retaining warmth and of excluding external heat, but in ordinary sheds an inner lining of boarding, leaving an air space of about 9 in., would be too expensive, so the difficulty has been surmounted by running some light wires parallel with the purlins of a roof, and about 12 in. apart, upon which a thin layer of straw is laid. The comfort of a thatched roof is to some extent attained in this way.

Thatching possesses some advantages over other methods. It is light, impervious to moisture, and of good weathering quality when skilfully laid. Wheat straw is the best to employ, being a good non-conductor and more durable than oat straw. For coverings in isolated positions it is very suitable, but needs to be particularly secured at the eaves to avoid lifting under the influence of high winds. In some farms galvanised rick covers are used, fastened by strand wire looped both ends in an approved manner.

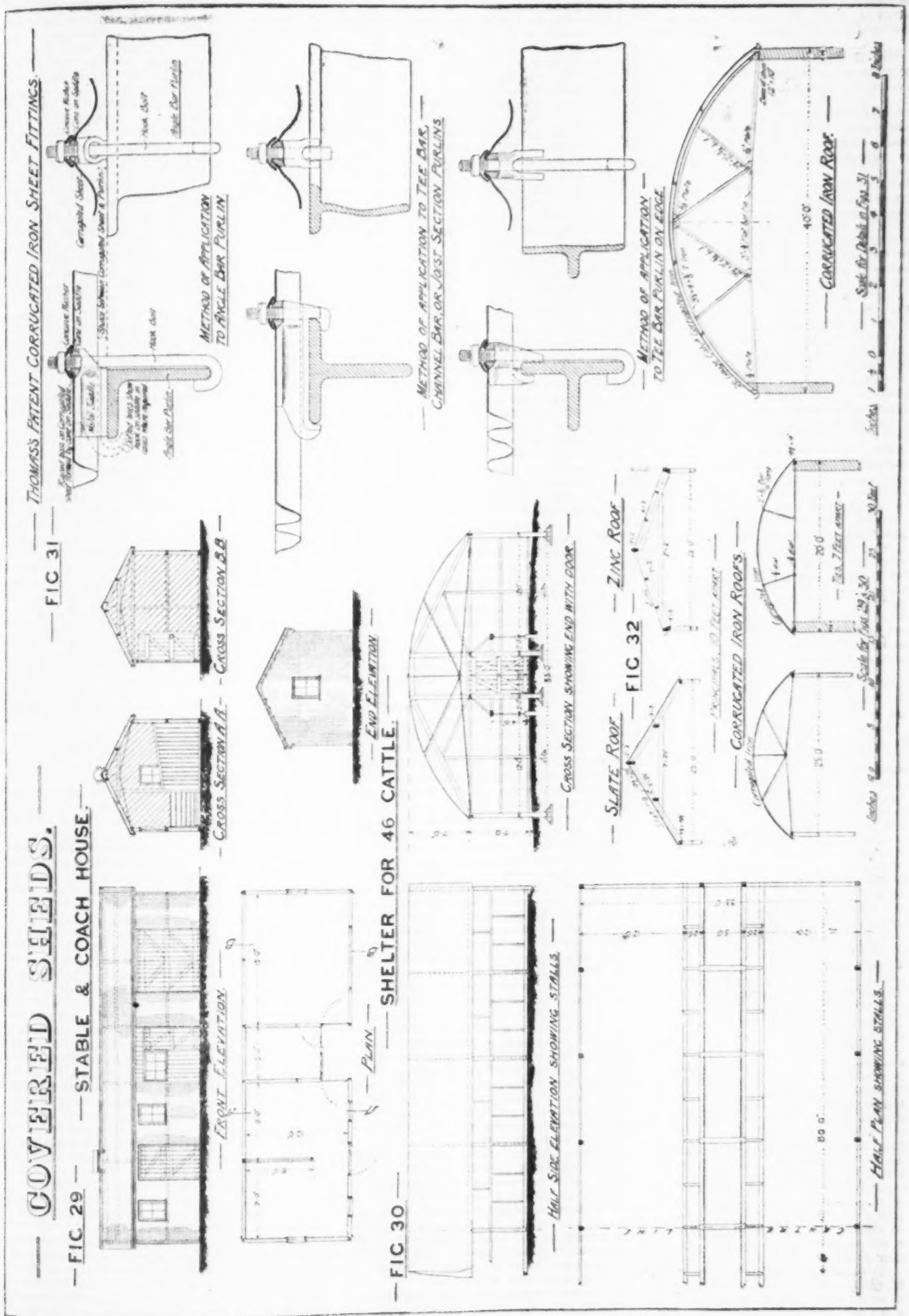
Tile roofs are seldom watertight. Pan tiles are common and cheap. Plain tiles are expensive, and they are smaller than pan tiles, but requiring more lap they are heavier per square. They can be laid to any slope from 25 deg. to 60 deg. Slates need an angle of about 2 to 1 or 25½ deg. to 30 deg., but zinc, lead, and corrugated iron can be laid at a slope of 4 deg. Pan tiles are mostly used for barns and sheds. They need strong roof timbers. Their size is about 13½ in. by 9½ in. by ½ in., weighing 5½ lbs. each. Plain tiles are 10½ in. by 6½ in. by ½ in., weighing 2½ lbs. each, and 11 in. by 7 in. by ⅝ in., weighing about 3 lbs. each. A square of roofing requires 800 plain tiles laid to a 3-in. gauge, 700 tiles to a 3½-in. gauge, and 600 to a 4-in. gauge. They need to be fastened with a galvanised iron nail for security to fir laths attached to rafters, no boarding being necessary. Pan tiles hold the moisture a long time, and are inferior to plain tiles.

Figs. 26, 27, and 28 show elevation and plan of a substantial shed constructed in timber as a lean-to against an existing building.

Roofs covered with felt should have a slope of at least 1 in 5; indeed, 1 in 2 would not be too much. Croggon's asphalte roofing felt is specially coated with an admixture of bitumen, and is considered impervious to rain, snow, or frost. It is sold at 1d. per square foot, subject to discount.

Willesden paper has also been employed for roofing purposes. The 4-ply at 9d. per yard run, 19 in. wide, or 2s. 6d. per yard run, 60 in. wide, can be laid directly on rafters or partition studding without boards. In the case of roofs it is held in position by outside battens 2½in. by 1 in., firmly nailed through the overlapping roofing. To suit the width of the paper, rafters 19 in. from centre to centre are required. At the eaves it is turned round a feather-edged board for security. It is found to be durable, but for permanent work should be painted every three years. In exposed situations it needs protection from wilful destruction, as it is easily damaged by mischievous boys throwing stones. When properly fixed at the outset, with ample overlap at the ends, Willesden paper proves itself capable of resisting gales and of withstanding the weather, but its sagging in wet weather is unsightly. It answers very well as a covering to keep dry, but is too free a conductor of heat and cold for covering cattle-sheds. It, however, makes a first-class underslating.

As an example of a covering for the feeding of cattle in yards, figs. 10 to 12 show a central feeding passage directly communicating with the food store, and the roof allows space for a manger and shelter for the cattle on each side. The posts are about 9 ft. apart and support the rails over the mangers, which form the fence to keep the animals out of the passage. There are no rafters beyond the principals, but it is evident that with a light tie-beam, the form of principal shown in fig. 11 is preferable to that in which the supporting verticals tend by their position, as in fig. 10, to create a transverse strain in the tie-beam. As


COVERED SHEDS.
FIG 29
STABLE & COACH HOUSE.
CROSS SECTION A-B
FRONT ELEVATION
PLAN
FIG 30
SHELTER FOR 46 CATTLE.
END ELEVATION
CROSS SECTION SHOWING END WITH DOOR
HALF SIDE ELEVATION SHOWING STALLS
HALF PLAN SHOWING STALLS
FIG 31
THOMAS'S PATENT CORRUGATED IRON SHEET FITTINGS.
METHOD OF APPLICATION TO ANGLE BAR PURLIN
METHOD OF APPLICATION TO TEE BAR, CHANNEL BAR, OR JOIST SECTION PURLINS
METHOD OF APPLICATION TO TEE BAR PURLIN ON EDGE
FIG 32
ZINC ROOF
SLATE ROOF
CORRUGATED IRON ROOFS
CORRUGATED IRON ROOF
Scale for Details of Fig 31
Scale for Fig 32

Illustrations to Paper on Roofing of Farm Buildings.—Sheet IV.

shown in fig 10 the weight mainly comes at the ends of the tie-beam, but if a straining beam with side struts were inserted as shown in fig. 12 these struts would communicate a large portion of this weight direct to the top of the vertical posts. In this case the collar-beam would remain the same for fig. 12 as for fig. 10.

A substantial form of continuous timber roofing is illustrated in figs. 13, 14, and 15, consisting of timber verticals 7 ft. 1½ in. apart longitudinally, and 18 ft. span weather-boarded to be covered with zinc or corrugated iron or other covering. Although, windows, doors, and sideboarding are not shown in the figures

they can be fixed as required, and the whole forms a class of covering suitable for a sheltered position that can be easily erected.

Mr. A. Dudley Clarke said he had much pleasnre in proposing a vote of thanks to Mr. Walmisley for his paper, which would form a most serviceable addition to the literature which the Institution possessed on the subject. There was no doubt a need for serviceable farm buildings at the present time, but the difficulty to contend with was the cost. Frequently substantially-erected buildings, which were sometimes used only for a few months in the year, could be adapted to more serviceable purposes than open shedding or barns. When this was done the building adapted had to be replaced by a cheap building, with a roof of corrugated iron or felt, although he did not approve of that material, and sometimes a wooden roof could be used, composed of creosoted board laid from ridge to eaves. He was surprised that the author had not referred to such a roof; it was very popular in some parts of Yorkshire and the eastern counties where such roofs had been found more satisfactory than iron. He did not think the author had been very happy in commencing his paper with a roof for a manure pit, for he did not see what use there could be for manure pits, and he would rather cover up more of the yard for cattle to run in in bad weather. As to the cost, as given by the author, of corrugated iron roofs for these manure pits, 1s. 5d. per foot super, or 12s. 9d. per yard super was too much for a roof of that kind. Figs. 1, 2, 3, and 4 represenied the spans of corrugated iron roofs constructed in a manner familiar to most of them, but in his practice he had found it more economical to use umber instead of iron tie rods; iron tie rods were apt to sink in the middle, although they were suspended by a king rod, and in some cases by two queen rods. Farmers had a habit of hanging up all sorts of things on those rods, and when such a thing as a ladder was hung up, it was easy for the roof to get out of shape. He had also found it very advantageous whenever roofs were being erected by country carpenters to run a piece of 4½ by 3 timber along in the centre of the roof or at each side, according to the span of the roof, as a kind of purlin. It added a certain amount of rigidity to the whole structure. As to the covering for wide spans, Mr. Walmisley showed a roof for a span of 50 ft., which was constructed in a very ingenious manner, but, so far as he could understand, the roof was intended to be covered with boards; but how could boards be fixed on a roof like that, and the roof be weather-tight? There was very little fall in the roof for water to run off, and if the boards were lapped there would be scarcely any fall at all. Reference had been made by the author to the cheapest roofs, which worked out at 6d. per square foot, or 4s. 6d. per yard of ground covered. In using corrugated iron, he did not see what the rafters were wanted for at all. The only rafters which he used were those which might be called principal rafters, which might be placed 10 ft. or 12 ft. apart, wherever the ties went across. If the principal rafters were put 10 ft. or 12 ft. apart, and some light purlins about 2½ by 3 placed about 4 ft. apart up the sides of the roof, that would be equally effective, and would be much more economical. Mr. Walmisley's cheapest roof was certainly a cheap form, but he (the speaker) thought it did not include the posts, which, of course, were very necessary. In the last edition of his book on "Farm Buildings," he had given particulars of a cheap form of roof which worked out, with posts, at 4s. 8d. per yard, as against the 4s. 6d. mentioned by Mr. Walmisley. As a matter of fact, he believed that if flat sheets of iron were used with a galvanised iron ridge, it was cheaper than a curved roof, but he did not think it was so sightly, and he questioned whether it was equally secure. As to the price of corrugated iron roofs, the one illustrated in fig. 3 was quoted at 0·64 per square foot. That was about 8d. per foot, or 6s. per square yard; but there were no posts, and he should think that that was a fair estimate of what roofs of that kind should cost; but if one compared that with another roof—referred to later on in the paper—a roof for an open shed, that cost 1s. 5d. per square foot of ground covered, or 12s. 9d. per square yard, he could not see why one roof should be double the cost of the other, as in both cases they were simple iron roofs on posts. The author had referred to painting on corrugated iron and the advisability of allowing the roof to remain some time unpainted, so as to allow the paint to get a better hold of the iron. That he was fully able to endorse, and his practice was to allow one winter to pass before he had such a roof painted, during which time certain chemical changes took place in the surface of the iron, causing the paint to adhere and penetrate to some extent. That was worth remembering, especially as people objected to the grey and cold look of corrugated iron; when painted with a common brown or oxide paint—a little of which went a long way, as iron could not absorb much—all objectionable looks disappeared. The author recommended the use of iron as far as possible, considering it more suitable than wood in the case of fire. He (the speaker) recently saw the ruins of a building when the fire had twisted the corrugated iron about in such a way as to render it quite unserviceable. Ventilation was an important and very often a troublesome question. Shaft ventilators were sometimes serviceable, but those mentioned were too expensive. He preferred an arrangement of perforated wood placed at intervals under the ridge; that was very serviceable and certainly not costly. There were certainly a number of advantages attached to the use of iron roofs. Such roofs were easily erected and easily taken down and put up again, and they were much less liable to damage by storm. An excellent Broseley tile or slate roof might be put up, but occasionally tiles were blown off, and the trouble of repair in such a case was avoided when corrugated iron was used. Felt he would rather not have anything to do with nor Willesden paper. As to wooden roofs, one had to be careful in laying the boards to allow a little for shrinkage, and where the roof was to be absolutely impervious to rain, wooden ones were not suitable, though they formed excellent roofs for open stock yards. These were the creosoted timber roofs before mentioned, with boards laid from ridge to eaves, with a slight space between as described in the last edition of his book.

Mr. T. A. Dickson seconded the vote of thanks. He said that in reference to Mr. Walmisley's remarks about well tarring weather-boarded buildings, he had found that such buildings treated with carbolineum lasted better. He had just been inspecting some recently-erected farm buildings, and he was able to say that a small building of brick and slate cost 4s. 2d. per square foot, and the weather-boarded and slated buildings only 2s. 6d. per foot of ground covered, and he thought that with proper treatment a weather-boarded building could be quite a permanent one. He had had no experience of zinc roofs, but he had with corrugated iron roofs, which he was afraid it was necessary to paint; and if that were so, he was not sure whether slate roofs were not the most satisfactory in the long run. As to hay sheds, he could emphasise what had been said as to the necessity of having the columns or girders which supported them as firm as possible in view of the occasional excessive wind pressure which the buildings were subjected to. As to tile roofs, if they were properly laid, there was no objection to them, and in some parts of the country where the carriage of slate or corrugated iron would be expensive, and when there were tile yards in the neighbourhood, pantiles, properly laid, made an excellent and economical roof.

Mr. C. John Mann said that small farms were in demand, while large ones were continually being cut up. As to covered yards and manure-pits, he agreed with Mr. Walmisley in saying that the more up-to-date farmers insisted on having them. He thought that Mr. Walmisley's suggestions for fixing and fitting corrugated iron were excellent. The painting of such roofs seemed to be necessary, but it was very expensive. The choice of materials must depend upon experience of the most easily obtainable materials and labour in the district. Weather-boarded buildings with a brick base 2 ft. above the ground made excellent buildings, but in Fig. 7 Mr. Walmisley did not show the brickwork to go so high; it would have been very much better to have put it at least 2 ft. above the ground, to prevent splashings from rain, &c., getting to the timber construction. Many old barns had been put into repair by him and converted into various sorts of buildings, and he rarely found a farmer ready to pull them down, however bad the state of repair. As to damp courses and air bricks, he thought they should never be omitted. Timber posts for curved corrugated iron roofs were generally more suitable than iron stanchions. He would have liked to have heard more as to movable roofs, which he thought might be serviceable and would probably come into more general use. Figs. 19 and 20 showed an excellent shelter for cattle, and he thought that 1s. 8d. per square foot seemed to be a very reasonable price for such an erection. Thatch made an excellent roof when it was put on well, but it was subject to vermin. He could not agree with Mr. Walmisley in saying that tiled roofs were not watertight. If properly laid, pantiles answered well. He wondered whether any one had ever thought of applying in a simple way the bacterial principle to farm drainage. Farm drainage, if treated in that way, would flow long distances, being absolutely liquefied, and it might be a good way of irrigating land at little expense.

Mr. S. Taylor said he had no prejudice against iron, for he was using it largely at the present time, but he thought it was out of place as a covering for live stock in farmyards. It was no doubt very well adapted for covering manure pits or hay and straw barns. He agreed with Mr. Walmisley that pantiles did not make a very satisfactory cover unless they were well laid, as they were very porous; but as to flat tiles, they were the very best covering that could be used. He had used them for twenty-five years and never had a complaint of a flat tile leaking or of their being carried away by storms. As to cost, small buildings could be covered with good timber roofing and slates at 9d. per foot super. of area covered and with best Staffordshire tiles at 11¾d., while for larger roofs with framed trusses, the cost was, for a slated roof 10½d. and for a flat tiled roof 1s. 0½d., which he thought would compare well with corrugated iron. The necessary supports for a roof of about 50 ft. span would cost 1s. 4½d. per foot, and for a roof 20-ft. span the price would be 11d. per foot super.; and so even from the point of view of cost everything was in favour of slates or flat tiles. As to wood roofs, a cheap material was creosoted board, which cost 7½d. per foot super., and that made a very good covering, very much better than corrugated iron.

Mr. A. Michelmore said that slate, when possible, and tile, pan or plain, were preferable to corrugated iron. The roof he preferred would work out, with posts 20 in. by 10 in. and Bangor slating, at 65s. per square of 100 ft. Mr. Walmisley in reference to corrugated iron roofs fixed the cost at 60s. per square, but in his (the speaker's) part of the country their cheapest corrugated iron roofs would cost 42s. They considered gable roofs preferable to circular iron roofs. As to the objection of a previous speaker that slates were occasionally blown off, he had known the whole of a corrugated iron roof to be blown away. He would have liked the lecturer to have said more as to the class of timber which should be used in roofs. In his opinion it was a matter of great importance that good foreign timber should be used in preference to English. He knew that English timber was going out of use for permanent roofing, but landlords sometimes thought that because they grew larch they should use it for all permanent buildings. That was a mistake, because larch buckled badly. As to pantiles, when the pitch was sufficient they made a good roof. His opinion was that for first-class farm buildings they must endeavour to get slate roofs or plain tiles; for second-class buildings they might have pantiles, and for third-class buildings they might use corrugated iron.

Mr. A. McDonald Brown said that the use of corrugated iron was advocated because it was supposed to be the cheapest material, but it was very difficult to get at the exact cost. He ventured to dispute the statement that iron was the best and most efficient covering for the price, and he thought that for the price quoted for iron roofs a slated or tiled roof could be put up which would be altogether preferable. He hoped that surveyors would not make themselves responsible for dotting England with tin tabernacles, and if they did they would be sure to hear of it at one of the Royal Academy banquets.

Mr. J. R. Parkin said felt was sometimes useful when a roof had been perforated.

Mr. J. H. Sabin said that he very seriously questioned whether the cost of covering a Dutch barn could be so serious as had been

suggested by the author of the paper if reasonable care were taken.

The Chairman said he agreed with Mr. Taylor to a great extent in his comparison of costs. In cheap buildings he had generally adapted the plan of using creosoted wood buildings, and he would like to ask the author of the paper whether he had had any experience of wood buildings?

The vote of thanks having been heartily agreed to,

Mr. Walmisley, in the course of a brief reply, owing to the lateness of the hour, said his object had not been to advocate corrugated iron roofs above other classes of construction, but to show from an engineer's experience how a corrugated iron roof might be put up. He certainly did not stand before them to say that corrugated iron was the best form of covering. As to Mr. Dudley Clarke's remarks he (the speaker) acknowledged that his paper was not exhaustive; it merely touched on some points of construction. There were a good many arguments in favour of timber, as against iron, but in all cases the local circumstances had to be considered, *i.e.*, how the material could be obtained as well as the labour for putting up the buildings. As to corrugated iron 22 B.W.G. could be fixed for an ordinary straightforward roof. As to creosoted timber buildings, creosote was an excellent preservative in certain circumstances, but how far did the preservation go when one bored a hole for a bolt? That hole was not creosoted and there was at once an element of weakness.

The meeting then terminated.

The next meeting will be held on the 10th inst., when a paper will be read by Mr. R. E. Middleton, entitled, "The Future of the London Water Supply."

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—An ordinary meeting of the Institution of Civil Engineers was held on the 4th inst. at Great George-street, Westminster, Mr. James Mansergh, President, in the chair. It was reported that eighty-five candidates had been admitted as students. The monthly ballot resulted in the election of ten members, eighty associate members, and one associate.

SOCIETY OF ENGINEERS.—At a meeting at the Royal United Service Institution, Whitehall, on the 3rd inst., Mr. Henry O'Connor, President, in the chair, a paper was read entitled "Recent Practice in Sewage Disposal," by Mr. Henry C. H. Shenton. The author first referred to the older methods of sewage disposal, pointing out that, until recently, failures of sewage works, constructed under all the older systems, had been notorious. As an example, he quoted the failure of the combined chemical treatment, filtration and land irrigation system at Sutton in 1895, two years after the works were constructed. Passing on to the modern system of bacterial purification he stated that it consisted of the resolution of impurities into inoffensive materials by the agency of micro-organisms. He pointed out that changes, formerly considered chemical, were really due to the action of bacteria, and that the bacteria necessary for the purification of sewage already existed in it. Turning to practical work, the author pointed out that for the bacterial treatment of sewage there were two methods—(1) that in which sewage passed through a tank where anaërobic organisms produced liquefaction of solids, and putrefaction as a step towards purification, the effluent being then purified on bacteria beds; and (2) the system in which no tank was used, the crude sewage being purified on bacteria beds only. In describing the practical construction and working of the bacteria bed, the author said it consisted of a water-tight tank, containing furnace clinker or other durable material likely to form a home for bacteria into which sewage could be run, and in which it could be held to bring it into contact with bacteria. The effluent from this bed, after it had stood a short time, would be greatly purified, and could be again treated on second or third contact beds. In describing the septic tank, the author said it was of practical use in getting rid of sludge, but he pointed out that the storage of putrid sewage in bulk was not an ideal arrangement. The septic tank was an air-tight chamber with trapped inlet and outlet, from which liquid only should be discharged, owing to the fact that solids must either float or sink. While pointing out the many admirable results obtained at works constructed by the Septic Tank Syndicate, the author drew attention to the failure of a septic tank constructed by the Leicester Corporation. He then showed that a septic tank need not necessarily be air-tight, as open and closed tanks had produced identical results. He also stated that gas generated in the Exeter septic tank was used for lighting purposes and for generating steam by which an 8 h.p. engine was driven. He pointed out the folly of allowing road grit to go on to bacteria beds, and said that first-contact beds were generally much over-worked. He suggested a possible improvement to obviate this, which consisted of an alteration in the construction of the first bed. He also said that automatic working was essential for success, and, in conclusion, he pointed out that the new system was equally applicable for the largest city or the smallest cottage. The paper was illustrated by diagrams and lime-light views of works.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third general meeting (business) of this Institute for session 1900-1901 was held on Monday at No. 9, Conduit-street, Regent-street, W., Mr. E. A. Gruning, Vice-President, in the chair.

The decease was announced of Mr. Henry Currey and Mr. Francis Chambers, and a vote of sympathy and condolence with relatives of the deceased was passed.

Mr. Frank W. Wills, of the Bristol Society of Architects, having been admitted a Fellow, the following gentlemen were then elected. As *Fellows*:—Messrs. Louis Ambler, London; T. Phillips Figgis, London; H. G. Ibberson, London; E. J. Jackson, Sydney, N.S.W.; C. E. Mallows, Bedford; J. W. Simpson, London. As *Associates*:—Messrs. S. Chesney, Stourbridge; G. E. Clay, Gravesend; C. H. Fitzwilliam Comyn, London; H. Cooper, Feniscowles Old Hall, near Blackburn; C. A. Daubney, London; W. E. Emerson, London; J. E. Franck, London; A. R. Groome, Manchester; H. Haines, New Brompton; E. V. Harris, London; J. S. Heath, Blackheath; W. Bonner Hopkins, London; P. Erskine Nobbs, M.A. Edin., Edinburgh; S. V. North, London; C. Wontner Smith, London; W. H. Swann, London; Alexander Symon, London; A. M. Torrance, jun., London; R. P. S. Twizell, Newcastle-on-Tyne; C. E. Varndell, London; C. F. Young, London. As *Hon. Associate*:—Mr. E. W. Smith, Member of the Royal Asiatic Society, Archæological Surveyor to the Government of India, N.W. Provinces and Oudh Circle, and Curator of the Lucknow (Government) Museum, Oudh; of the Museum, Lucknow, India; and Cheena Lodge, Naini Tal, N.W.P., India. As *Hon. Corresponding Members*:—MM. Joseph Antoine Bouvard (Director of the Architectural Works of the Paris Exhibition, 1900), of Paris; and L. C. Pedro D'Avila (Hon. Architect to the King of Portugal, Architect to the Government, Member of the Royal Academy of Fine Arts, Lisbon), of Lisbon.

The results were then announced of the November examinations.

The Preliminary examinations, qualifying for registration as *Probationer R.I.B.A.*, were held simultaneously in London, Birmingham, Bristol, Manchester, and York on the 6th and 7th ult. The examinations in the provinces were conducted by the Allied Societies of the respective centres. Of the 172 candidates admitted, claims for exemption from sitting were allowed to the number of thirty-two. The remaining 140 were examined, with the following results:—

	Examined.	Passed.	Relegated.
London	78	58	20
Birmingham ...	9	9	0
Bristol	11	7	4
Manchester	25	22	3
York	17	13	4
	140	109	31

The successful candidates, together with those exempted, making a total of 141 newly-registered Probationers, are as follows:—

A. W. Anderson, Horsham; A. Ashton, Rugby; G. T. Austin, Edgbaston, Birmingham; W. T. McN. Barrett, Stoke-on-Trent; J. C. Beare, Stanmore, Newton Abbot; Baron W. R. Beaumont, Exeter; F. Bell, Manchester; H. Black, Hampstead; C. L. Blethyn, Cardiff; Annie W. Bradshaw, Bolton; J. E. Braithwaite, Leeds; C. H. Brightiff, Southampton; F. G. Brooker, Peckham Rye; C. F. H. Brookes, Eye, Peterborough; R. J. Buck, Horsham; H. W. Burchett, Brixton; C. L. Burns, Forest-row, Sussex; H. W. Cathie, East Sheen; E. Chaplin, Hove; A. W. Clapham, Beckenham; P. M. B. Collcutt, London; J. O. Cook, Plumstead; L. J. Coussmaker, Walthamstow; P. G. Crawley, Peterborough; T. E. Crompton, Petersfield, Hampshire; J. J. Crowe, Brentwood; L. Crowley, Portsmouth; J. Day, Wakefield; W. H. Evans, Southampton; H. J. Fairburn, London; G. A. Farrar, Huddersfield; C. Forsyth, Glasgow; R. C. Foster, Loughton; W. J. Freeman, Halifax; E. L. Frost, Anerley; N. H. T. Fuller, Taunton; A. H. Gadsdon, Chichester; R. M. Geater, Holloway; W. H. George, Cheltenham; W. H. Godfrey, Catford; G. H. Goldsmith, Cheshire; A. C. Goulder, Leytonstone; A. G. Greenwood, South Kensington; C. Groves, Chester-le-Street; A. W. Hall, Ealing; L. H. Harrington, Bromley; W. Harvey, London; D. P. Hayworth, London; C. J. Hazard, Boscombe; A. J. Healey, London; H. Healey, Didsbury, near Manchester; W. B. Hellard, Teddington; J. L. Henderson, Edinburgh; F. Higginbottom, Withington, Manchester; E. F. Hill, Winchester; R. M. Hilton, Wimbledon; C. V. Hodges, Leicester; S. R. Hollingdale, Bayswater; J. B. Holt, Levenshulme; P. B. M. Hope, Perth; C. E. Howitt, Nottingham; H. Hunnisett, Rye, Sussex; D. B. Hutton, Glasgow; W. H. Hyde, Nailsworth, near Stroud; A. L. Iredale, Stroud; J. P. Irvine, Lincoln; J. W. Jarvis, Moseley; H. F. Keighley, Moss Side, Manchester; A. H. Laister, Wakefield; W. B. Lates, Birmingham; W. Leahy, Yeovil; G. Leresche, Kersal, Manchester; T. C. Little, Longtown, Cumberland; R. A. Loveitt, Coventry; A. S. W. Mackay, West Walls, Carlisle; W. K. McDermott, Boro' Green, Kent; R. B. Medcalf, Aughton, near Ormskirk; R. Mercer, Great Harwood, near Blackburn; S. Moss, Eccles; G. E. Moxon, Barnsley; S. H. J. Murch, Loughton; A. F. Murray, London; J. R. Musto, Hornsey Rise; G. V. Myer, Maida Vale; F. G. Newton, London; F. Nicholls, Whipps Cross, Leyton; F. A. C. Old, Highgate; G. M. Owen, Birkenhead; B. C. Page, Tonbridge; J. Page, South Lowestoft; H. J. Parr, Brixton; W. E. Paterson, Cheltenham; A. E. S. Payne, New Cross; J. H. Pearson, Balham; W. A. S. Pettit, Balham; W. H. Pickard, Whitchurch, Shropshire; J. Plottel, Middlesbrough; H. A. Porter, Gravesend; C. H. Potter, Matlock Bridge; G. A. Potts, Manchester; A. F. Potts, Leytonstone; W. Pyper, Cults-by-Aberdeen; L. G. Rayner, Gravesend; C. A. Reed, Clapham; T. H. Rhodes, Leeds; A. S. Robertson, Perth; D. G. Round, Sutton; J. A. Ryan, London; H. Savage, St. Albans; D. G. J. Saw, Green-lanes; H. S. Sawyer, Winchester; J. H. Sayner, Harrogate; H. S. Scott, Handsworth, Birmingham; H. E. Seccombe, Clapham Common; W. C. B. Sinclair, Bexley; B. C. Smith, Caversham; H. S. Smith, Manchester; H. Solomon, Haulgh, Bolton; P. H. Solon; Stoke-on-Trent; S. M. Spoor, East Putney; W. Stockdale, North Shields; E. A. Sudbury, Nottingham; F. Sykes, Kendal; R. J. Tall, Gravesend; T. T. Tallon, Bolton; H. F. Tasker, Hampstead; B. W. Thomas, Southampton; T. Thorne, Brockley; J. E. Tindall, Lavender Hill; W. Turpin, Roker, Sunderland; H. Unwin, Bolton; F. Wade, Frizinghall, Bradford; F. A. Walker, Hampstead; P. Weston, Sheffield; N. C. Wetherilt, South Hampstead; O. White, Barton-under-Needwood, near Burton-on-Trent; E. C. M. Willmott, Roath, Cardiff; A. W. Wilson, Peterborough; R. Wilson, Sheffield; J. L. Worssell, Regent's Park; R. Wylie, Gateshead-on-Tyne.

The Intermediate examination, qualifying for registration as *Student R.I.B.A.*, was held in London and the various provincial centres indicated below on November 6, 7, and 8. The examinations in the provinces were conducted by the Allied Societies of the respective districts. Fifty-nine candidates were examined, the results being as follows:—

	Total Examined.	Passed.	Relegated.
London	45	29	16
Bristol	6	2	4
Manchester	8	4	4
	59	35	24

The successful candidates, whose names have

been entered on the Register of *Students R.I.B.A.*, are as follows, the names being given in order of merit :—

A. J. Hope, Atherton, Manchester ; E. L. Gaunt, Ilkley ; W. E. Dobson, West Hampstead ; D. L. Allan, Dundee ; H. A. Hall, Hastings ; H. J. B. Hoskins, Birmingham ; A. J. Taylor, Bath ; F. Haswell, North Shields ; T. W. Whipp, Scarborough ; H. Prince, Bayswater ; S. C. Stephens, Hockley, Birmingham ; O. P. Milne, Bedford ; W. R. Davidge, Teddington Park-road, S.W. ; N. C. Smith, London ; E. J. Dixon, Stratford ; A. R. Gradwell, Blackburn ; V. Hooper, Redhill ; J. G. Wilson, Maida Hill ; J. H. de C. Ballardie, London ; G. B. H Hoole, Highgate ; G. H. Lovegrove, Herne Hill ; M. N. Castello, London ; J. J. S. Naylor, Bayswater ; R. Bennett, Buxton ; C. E. L. Parkinson, Kennington ; B. C. Chilwell, Wednesbury ; A. C. Notley, London ; H. F. Clarke, Pendleton, near Manchester ; L. Leeper, Great Yarmouth ; F. A. Ling, Mitcham, A. A. Midwinter, London ; W. B. Rees, Cardiff ; C. E. B. Sutton, Warrington ; C. R. Thickpenny, Bournemouth ; F. E. Tomson, King's Norton.

The Final and Special Examinations, qualifying for candidature as *Associate R.I.B.A.*, were held in London from November 16 to 23. Of the fifty-one candidates examined, twenty-six passed, and the remaining twenty-five were relegated to their studies. The successful candidates are as follows :—

T. B. Ball, Weston-super-Mare ; E. W. Banfield, Camberwell ; G. Brumell, jun., Morpeth ; H. M. Cautley, Westminster ; *W. G. Cogswell, Wallasey, Chester ; *W. E. F. Crook, London ; H. A. Douglass, Brighton ; T. W. Gordon, Nottingham ; A. H. Goslett, Great Stanmore ; S. Harrison, Leicester ; *C. E. Hutchinson, London ; A. L. MacGibbon, Edinburgh ; R. H. J. Mayhew, Anerley ; W. V. Morgan, Carmarthen ; R. W. Owen, Waterloo, Liverpool ; A. W. Papworth, Maida Hill ; J. Quail, Leamington Spa ; F. J. O. Smith, Westminster ; E. J. Tench, Cambridge ; C. B. Thomas, London ; N. Thorp, Clapham ; *H. A. Tinker, Kensington ; P. J. Turner, Stowmarket ; W. J. Walford, Anerley ; R. D. Wells, London ; E. P. Wheeler, Chelsea.

[* Candidates marked thus * were admitted to the Special Examination, under the following regulation :—"Architects in practice not less than twenty-five years of age, and chief assistants over thirty years of age, who desire to be admitted as Associates, can be exempted from passing the Preliminary and Intermediate Examinations and in sending in Testimonies of Study. They can be admitted, by resolution of the Council from each case, to a Qualifying Examination (namely, the Final of the three examinations), which is conducted with especial regard to the requirements of such architects, their professional works and position being duly taken into account by the Board of Examiners."]

The following table shows the number of failures in each subject of the Final and Special Examinations :—

I. Design	24
II. Mouldings and Ornament	10
III. Building Materials	5
IV. Principles of Hygiene	1
V. Specifications	4
VI. Construction : Foundations, &c.	3
VII. Construction : Iron and Steel, &c.	3

Amendments to the Form of Building Contract.

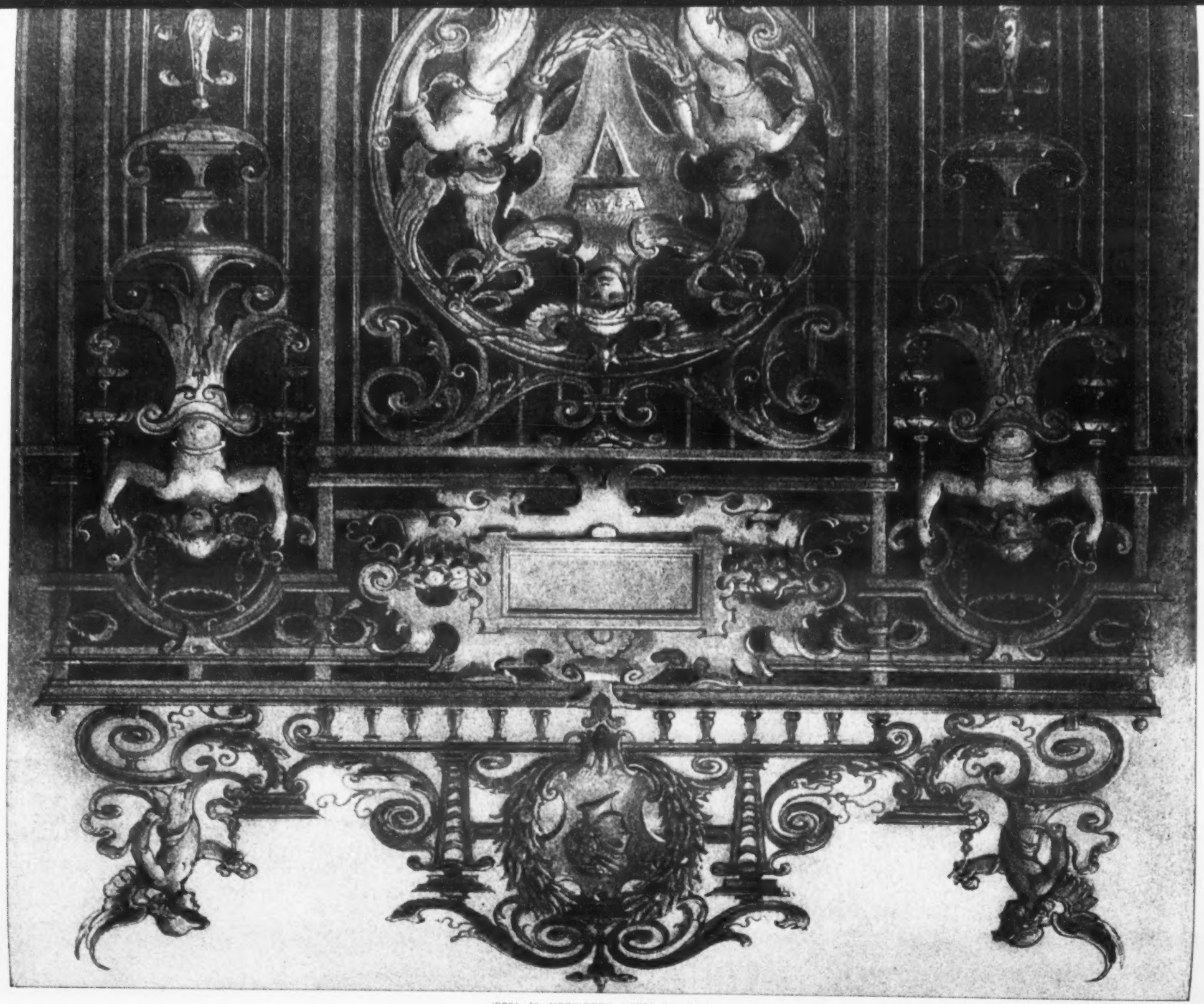
The meeting then considered amendments to the "Form of Agreement and Schedule of Conditions for Building Contracts" as agreed upon between the Council of the Institute and the Council of the Institute of Builders. The clauses as they stand in the existing Form of Contract, and the same clauses as amended, are here set out in opposite columns.

The Chairman announced that in consequence of representations made to the Council they had decided to postpone consideration of Clause 32 in order to consider it further, and to bring it forward at a future business meeting.

After some discussion of Clauses 1 and 32, it was agreed to postpone further consideration of the amended clauses until the Council had had an opportunity of reconsidering Clause 32, and of bringing it before members in the shape the Council should then consider it advisable to recommend.

The meeting then terminated.

The Original Clauses.	*The Clauses as Amended and Now Proposed for Adoption.*
1. The works shall be carried out in accordance with the directions and to the reasonable satisfaction of the architect in accordance with the said drawings and specification, and in accordance with such further drawings, details, and instructions in explanation of the same as may from time to time be given by the architect. The contract drawings and specification shall remain in the custody of the architect, and shall be produced by him at his office as and when required by the employer or by the contractor.	1. The works shall be carried out in accordance with the directions, and to the reasonable satisfaction of the architect, in accordance with the said drawings and specification, and in accordance with such further drawings, details, and instructions in explanation of the same as may from time to time be given by the architect. If the work shown on any such further drawings or details, or necessary to comply with any such instructions, directions, or explanations, be, in the opinion of the contractor, in excess of that comprised in the contract, he shall, before proceeding with such work, give notice in writing to this effect to the architect. In the event of the architect and contractor failing to agree as to whether or not there is any excess, and of the architect deciding that the contractor is to carry out the said work, the contractor shall accordingly do so, and the question whether or not there is any excess, and if so the amount thereof, shall, failing agreement, be settled by the arbitrator as provided in Clause 32, and the contractor shall be paid accordingly. The contract drawings and specification shall remain in the custody of the architect, and shall be produced by him at his office as and when required by the employer or by the contractor.
12. The contractor shall not vary from the drawings or specifications except as provided by Clause 5, or by the authority of the architect, which is to be sufficiently proved by any writing or drawing given by him or by any subsequent written approval by him. If the work shown on any of the details or the further drawings or details referred to in Clause 1, or necessary to comply with any instructions, directions, or explanations which may be given from time to time by the architect be, in the opinion of the contractor, in excess of that comprised in the contract, he shall, before proceeding with such work, give notice in writing to this effect to the architect. In the event of the architect and contractor failing to agree as to whether or not there is any excess, and of the architect's deciding that the contractor is to carry out the said work, the contractor shall accordingly do so, and the question whether or not there is any excess, and if so the amount thereof, shall, failing agreement, be settled by the arbitrator as provided in Clause 32, and the contractor shall be paid accordingly. No claim for an extra shall be allowed unless it shall have been executed under the provisions of Clause 5, or by the authority of the architect as herein mentioned. Any such extra is hereinafter referred to as an authorised extra.	12. The contractor shall, when authorised by the architect, or as provided by Clause 5, vary by way of extra or omission from the drawings or specification ; such authorisation is to be sufficiently proved by any writing or drawing given by the architect, or by any subsequent written approval by him. No claim for an extra shall be allowed unless it shall have been executed under the provisions of Clause 5, or by the authority of the architect as herein mentioned. Any such extra is hereinafter referred to as an authorised extra.
17. Any defects, shrinkage, or other faults which may appear within months from the completion of the works, arising in the opinion of the architect from materials or workmanship not in accordance with the drawings and specification or the instructions of the architect, or any damage to pointing by frost appearing within the like period, shall upon the directions in writing of the architect, and within such reasonable time as shall be specified therein, be amended and made good by the contractor at his own cost, unless the architect shall decide that he ought to be paid for the same ; and in case of default the employer may employ and pay other persons to amend and make good such defects, shrinkage, or other faults or damage, and all expenses consequent thereon or incidental thereto shall be borne by the contractor, and shall be recoverable from him by the employer, or may be deducted by him from any moneys due or that may become due to the contractor. Should any defective work have been done or material supplied by any sub-contractor or other person* employed on the works who has been nominated or approved by the architect, the contractor shall be liable to make good in the same manner as if such work or material had been done or supplied by the contractor, and been subject to the provisions of this and the preceding clause.	17. Any defects, shrinkage, or other faults which may appear within months from the completion of the works, arising in the opinion of the architect from materials or workmanship not in accordance with the drawings and specification or the instructions of the architect, or any damage to pointing by frost appearing within the like period, shall upon the directions in writing of the architect, and within such reasonable time as shall be specified therein, be amendsd and made good by the contractor at his own cost, unless the architect shall decide that he ought to be paid for the same ; and in case of default the employer may employ and pay other persons to amend and make good such defects, shrinkage, or other faults or damage, and all expenses consequent thereon or incidental thereto shall be borne by the contractor and shall be recoverable from him by the employer, or may be deducted by him from any moneys due or that may become due to the contractor. Should any defective work have been done or material supplied by any sub-contractor employed on the works who has been nominated or approved by the architect, the contractor shall be liable to make good in the same manner as if such work or material had been done or supplied by the contractor, and been subject to the provisions of this and the preceding clause.
* The omission of these words "or other person" is the sole difference between the original and the revised Clause 17.	
20. No sub-contractor or other person nominated by the architect shall be employed upon the works against whom the contractor shall make what the architect considers reasonable objection, or who will not enter into a contract with the contractor guaranteeing the due performance of his work, and indemnifying the contractor against any claims arising out of misuse by the sub-contractor or his workmen of any scaffold erected or plant employed by the contractor, or that may be made against the contractor in consequence of any act, omission, or default of the sub-contractor, his servants, or agents.	20. All specialists, merchants, tradesmen, or others executing any work, or supplying any goods for which prime-cost prices or provisional sums are included in the specification, who may at any time be nominated, selected, or approved by the architect, are hereby declared to be sub-contractors employed by the contractor ; but no such sub-contractor shall be employed upon the works against whom the contractor shall make what the architect considers reasonable objection, or who will not enter into a contract with the contractor upon terms and conditions consistent with those in this contract, and securing the due performance and maintenance of the work supplied or executed by such sub-contractor, and indemnifying the contractor against any claims arising out of the misuse, by the sub-contractor or his workmen, of any scaffold erected or plant employed by the contractor, or that may be made against the contractor in consequence of any act, omission, or default of the sub-contractor, his servants or agents, and against any liability under the Workmen's Compensation Act, 1897, or any amendment thereof.



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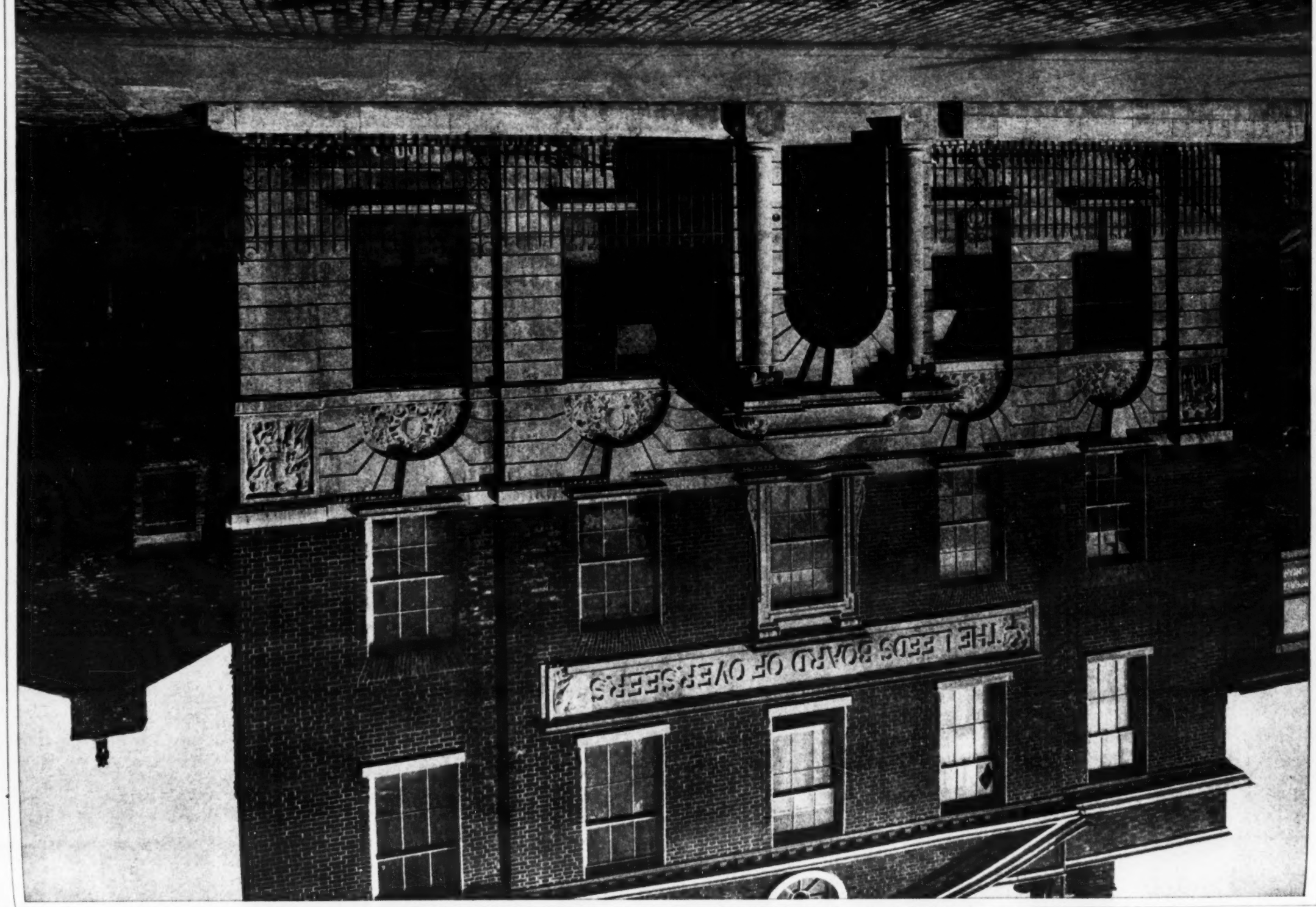
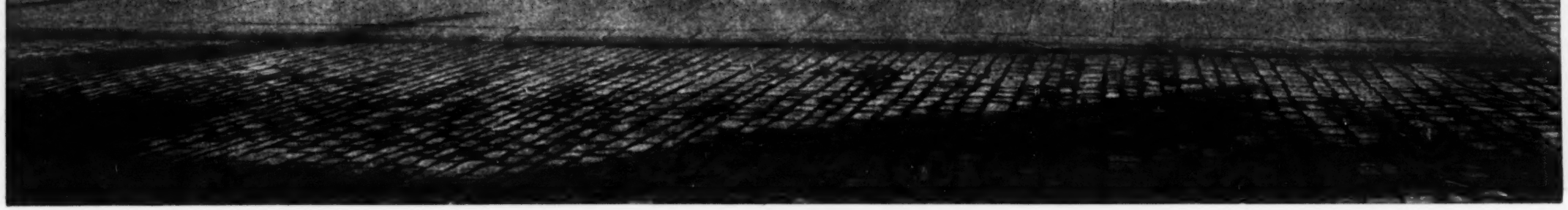
INA PHOTO SPRAGUE & C° L^TD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

SCREEN IN WROUGHT IRON.—Designed by Mr. John J. Shaw


THE LEEDS BOARD OF OVERSEERS



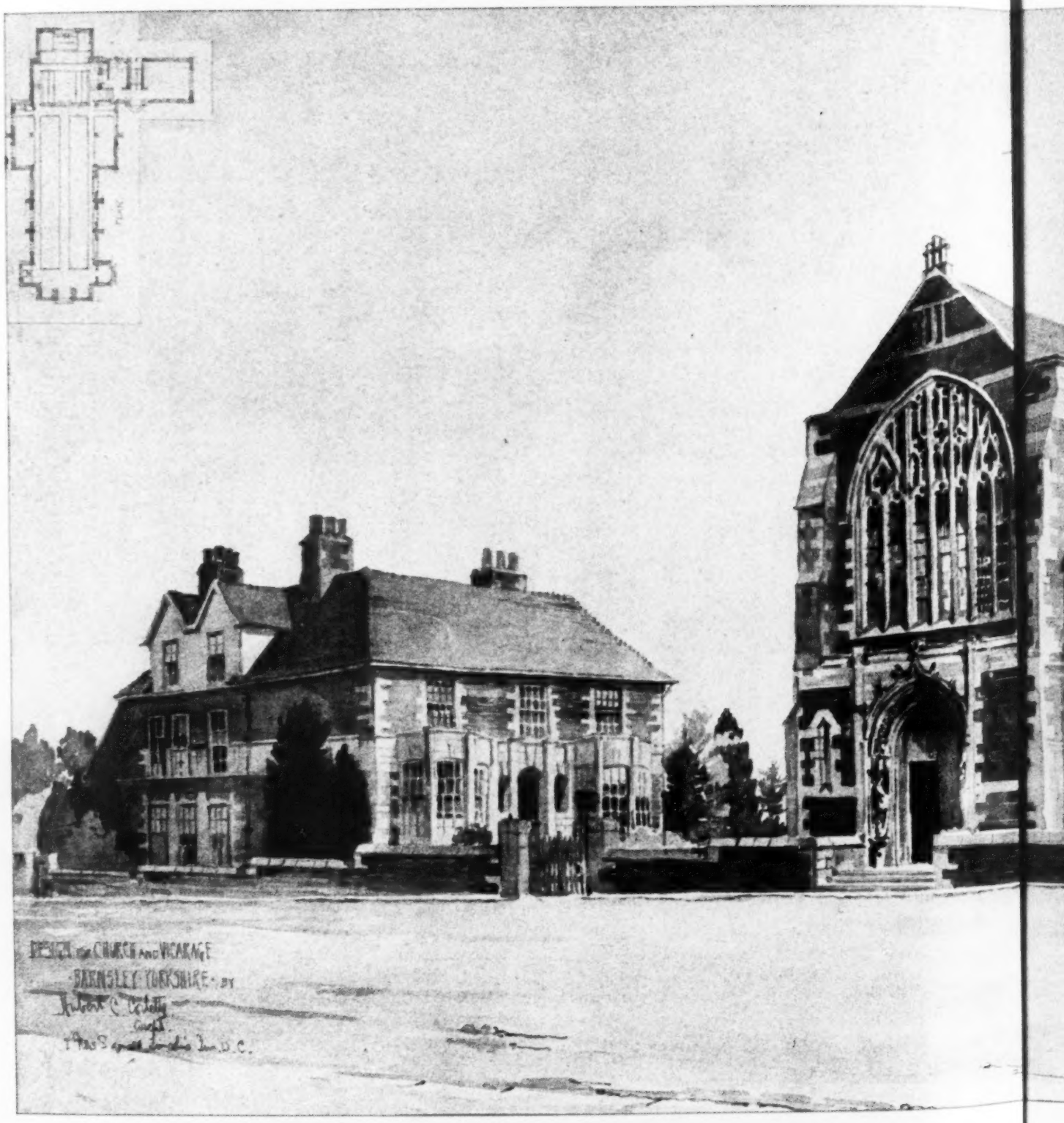
DETAIL OF FRONT.

FRONT BEFORE ALTERATION.

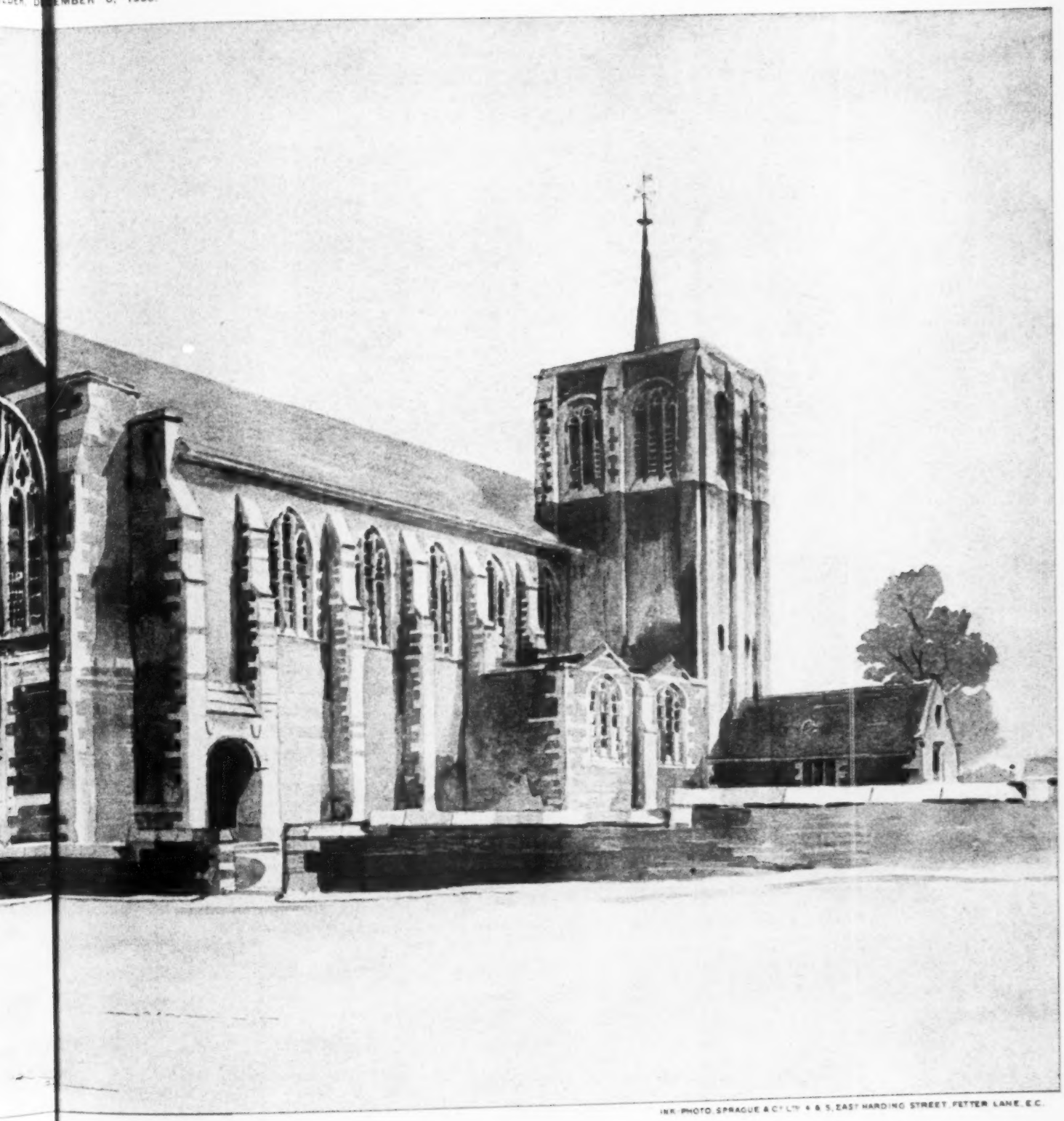
FRONT AS RE-MODELLED.

HA-PHOTO. SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

OLD HOUSE AS RE-MODELLED FOR THE LEEDS BOARD OF OVERSEERS.—Messrs Bedford & Kitson, Architects.



DESIGN for CHURCH AND VICARAGE
BARNSLEY YORKSHIRE. BY
Robert C. Kelly
ARCHT
1 Pall Mall East London S.W.



INK PHOTO SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

SCALE OF FEET
MANAGER'S ROOM
PRIVATE ENTRANCE
BANKING OFFICE
DOOR
BACK ENTRANCE
PLAN
LONDON AND COUNTY BANK
LONDON AND COUNTY BANK

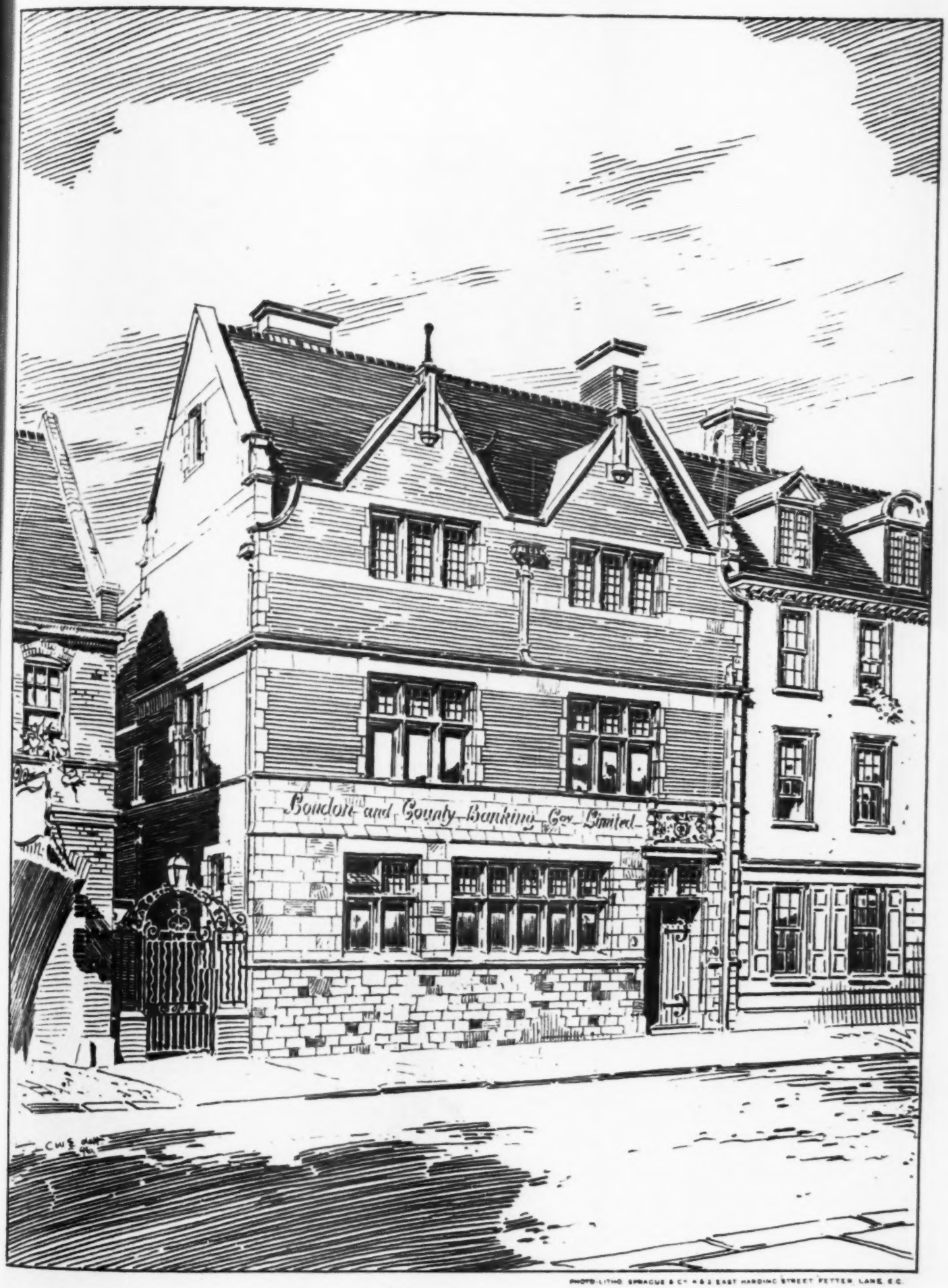


PHOTO-LITHO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

BANK AT BATTLE.—Mr. W. Campbell Jones, A.R.I.B.A., Architect.

21. The contractor shall be responsible for all structural and decorative damage to property, and for injury caused by the works or workmen to persons, animals, or things, and shall hold the employer harmless in respect thereof. He shall also be responsible for all injuries caused to the buildings, the subject of this contract, by frost, or other inclemency of weather, and shall reinstate all damage caused by the same, and thoroughly complete the whole of the works.

28. The provisional sums mentioned in the specification for materials to be supplied or for work to be performed by special artists or tradesmen, or for other works or fittings to the building, shall be paid and expended at such times and in such amounts and to and in favour of such persons as the architect shall direct, and sums so expended shall be payable by the contractor without discount or deduction, or (without prejudice to any rights of the contractor existing under the contract referred to in Clause No. 20) by the employer to the said artists or tradesmen. The value of works which are executed by the contractor in respect of provisional sums, or in additional works, shall be ascertained as provided by Clause 13. At the settlement of the accounts the amount paid by the contractor to the said artists or tradesmen, and the said value of such works executed by the contractor, shall be set against all such provisional sums or any sum provided for additional works, and the balance shall be added to or deducted from the contract sum.

29. The contractor shall, unless otherwise stated in the specification, provide and erect all necessary scaffolding and plant for the due execution by the artists and tradesmen referred to in the preceding Clause of the work entrusted to them. He shall also permit of the execution of work by any other artists or tradesmen who may be engaged by the employer.

32. Provided always that in case any dispute or difference shall arise between the employer or the architect on his behalf and the contractor, either during the progress of the works or after the determination, abandonment, or breach of the contract, as to the construction of the contract or as to any matter or thing arising thereunder (except as to the matters left to the sole discretion of the architect under Clauses 4, 9, and 19, and the exercise by him under Clause 18 of the right to have any work opened up), or as to the withholding by the architect of any certificate to which the contractors may claim to be entitled, then either party shall forthwith give to the other notice of such dispute or difference, and such dispute or difference shall be and is hereby referred to the arbitration and final decision of or, in the event of his death or unwillingness or inability to act, of or, in the event of his death or unwillingness of inability to act, of a person to be appointed on the request of either party by the President for the time being of the Royal Institute of British Architects, and the award of such arbitrator shall be final and binding on the parties. Such reference, except on the question of certificate, shall not be opened until after the completion or alleged completion of the works, unless with the written consent of the employer or architect and the contractor. The arbitrator shall have power to open up, review, and revise any certificate, opinion, decision, requisition, or notice, save in regard to the said matters expressly excepted above, and to determine all matters in dispute which shall be submitted to him, and of which notice shall have been given as aforesaid, in the same manner as if no such certificate, opinion, decision, requisition, or notice had been given. Upon every or any such reference the costs of and incidental to the reference and award respectively shall be in the discretion of the arbitrator, who may determine the amount thereof, or direct the same to be taxed as between solicitor and client or as between party and party, and shall direct by whom and to whom and in what manner the same shall be borne and paid. This submission shall be deemed to be a submission to arbitration within the meaning of the Arbitration Act, 1889.

21. The contractor shall be responsible for all structural and decorative damage to property, and for injury caused by the works or workmen to persons, animals, or things, and shall hold the employer harmless in respect thereof, and also in respect of any claim made under the Workmen's Compensation Act, 1897, or any amendment thereof, by any person in the employ of the contractor. He shall also be responsible for all injuries caused to the buildings, the subject of this contract, by frost or other inclemency of weather, and shall reinstate all damage caused by the same, and thoroughly complete the whole of the works.

28. The provisional sums mentioned in the specification for materials to be supplied or for work to be performed by special artists or tradesmen, or for other works or fittings to the building, shall be paid and expended at such times and in such amounts and to and in favour of such persons as the architect shall direct, and sums so expended shall be payable by the contractor without discount or deduction, or (without prejudice to any rights of the contractor existing under the contract referred to in Clause No. 20) by the employer to the said artists or tradesmen. The value of works which are executed by the contractor in respect of provisional sums, or in additional works, shall be ascertained as provided by Clause 13. At the settlement of the accounts the amount paid by the contractor to the said artists or tradesmen, and the said value of such works executed by the contractor shall be set against all such provisional sums or any sum provided for additional works, and the balance, after allowing *pro rata* for the contractor's profits at the rates contained in the contractor's original estimate, shall be added to or deducted from the contract sum, provided that in estimating the amounts paid as last herein provided no deductions shall be made by or on behalf of the employer in respect of any damages paid by the sub-contractor to the contractor, the intention being that the contractor and not the employer shall have the benefit of any such damages.

29. The contractor shall permit the execution of work by any other artists or tradesmen who may be engaged by the employer.

32. Provided always that in case any dispute or difference shall arise between the employer or the architect on his behalf and the contractor, either during the progress of the works or after the determination, abandonment, or breach of the contract, as to the construction of the contract, or as to any matter or thing arising thereunder (except as to the matters left to the sole discretion of the architect under Clauses 4, 9, and 19, and the exercise by him under Clause 18 of the right to have any work opened up), or as to any objection by the contractor to any certificate, finding, decision, requisition, or opinion of the architect, or to the withholding or failure by the architect to give the same, then either party shall forthwith give to the other notice of such dispute or difference, and such dispute or difference shall be and is hereby referred to the arbitration and final decision of or, in the event of his death or unwillingness or inability to act, of or, in the event of his death or unwillingness or inability to act, of a person to be appointed on the request of either party by the President for the time being of the Royal Institute of British Architects, and the award of such arbitrator shall be final and binding on the parties. The arbitrator shall have power to determine all such matters in dispute except as aforesaid which shall be submitted to him, and of which notice shall have been given as aforesaid. The works shall not be stopped pending such reference excepting by the direction in writing or award of the arbitrator. If either party desires to have such dispute or difference determined forthwith, he shall give written notice to that effect to the other party, and the arbitrator shall, with the assent in writing of the other party, proceed with the arbitration. In the event of the other party failing within days of such notice to give to the other his assent in writing to the immediate determination of such dispute or difference, the arbitrator shall, after written notice to the non-assenting party of a time and place of hearing, decide whether such dispute or difference shall be immediately determined or whether such determination shall await the completion or alleged completion of the works, and the same shall be determined at such time or times as the arbitrator shall decide. If in any such reference the arbitrator shall be of opinion that either party has been unreasonable or vexatious or dilatory either in invoking or insisting upon reference or in the mode of its conduct, or that injury from delay or otherwise has been occasioned thereby to the other, he may by his award indemnify the latter in respect of such injury. Upon every or any such reference the costs of and incidental to the reference and award respectively shall be in the discretion of the arbitrator, who may determine the amount thereof, or direct the same to be taxed as between solicitor and client, or as between party and party, and shall direct by whom and to whom and in what manner the same shall be borne and paid. This submission shall be deemed to be a submission to arbitration within the meaning of the Arbitration Act, 1889.

ARCHITECTURAL SOCIETIES.

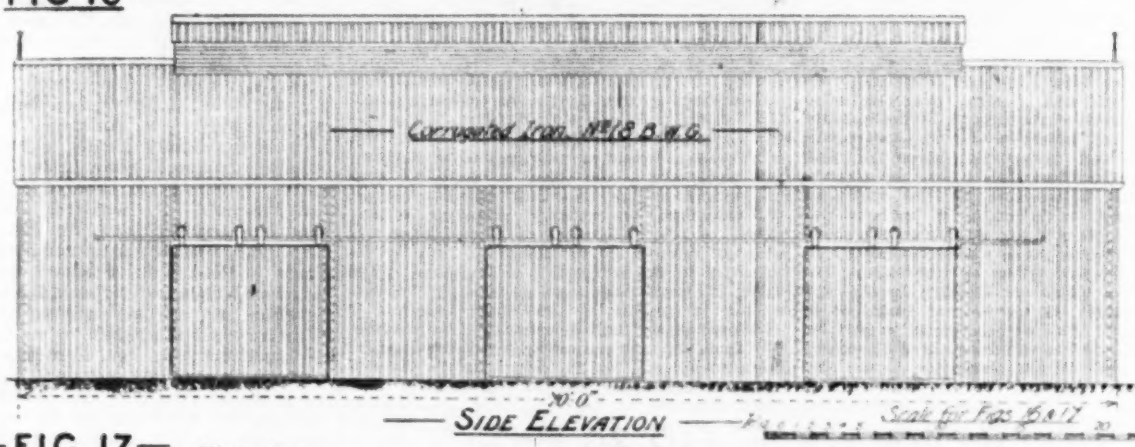
EDINBURGH ARCHITECTURAL ASSOCIATION.—The inaugural meeting for this session of the Edinburgh Architectural Association was held on the 28th ult. in the Royal Institution. The President, Mr. Henry F. Kerr, A.R.I.B.A., delivered an opening address, which took the form of a paper describing "A Visit to Melrose Abbey." The subject was copiously illustrated by limelight views. Mr. Kerr sketched in outline the history of the Abbey, from its foundation by David I, in 1136, when a colony of Cistercian monks (only lately settled in England) were established on the silver banks of the Tweed from Rievaulx, in Yorkshire. Like all the border abbeys and churches, its buildings suffered many devastations, most notably by Edward I., Edward II., Richard II., and the Earl of Hertford. But, though damaged and pillaged by the Kings of England, it was honoured and fostered by the Kings of Scotland. Founded by David I., gifted with fines and forfeited lands by Robert the Bruce, and further enriched by Alexander II., it reached the zenith of its fame in the thirteenth century. Mr. Kerr then described in detail the existing remains. He indicated the probable extent of the church and the cloisters, and observed that the importance of the Abbey was apparent from the great size of the latter. At Melrose the cloister was evidently 150 ft. square, only that of St. Andrews being greater in Scotland, and those of Salisbury and Norwich alone being greater in England. The very excellent carving which is noticeable in the earliest work in the cloister is also to be seen throughout all the remains. Examples of these carvings were shown in detail on the screen. The ritual choir, with rood screen and great arch over it, and the examples of flying buttresses, were fully explained. The north transept with its early and late work, its Crown of Thorns window, and late clearstory, were all in turn commented on. The south transept, with its south gable with doorway and great window, its adornment with niches and buttresses, and the grouping of all the parts next claimed attention. Mr. Kerr explained the difficulties in the way of dogmatising about the dates of later work in Scotland, and mentioned the various opinions that are held on this subject. The unusual features in the plan claimed some attention. For example, the cloisters being on the north side of the nave rather than as usual on the south side; the range of chapels opening off the south side of the nave; and the shortness of the choir, or eastern arm of the church, necessitating the ritual choir encroaching to the length of three bays into the nave. The last King whose name is associated with this abbey was James IV., who married Margaret Tudor. The royal arms, with the date 1505, are borne by one of the chapel buttresses, and it is said that one of the bosses in the vault of the sanctuary, or extreme eastern portion of the choir, is sculptured with the arms of his queen. The beautifully-ribbed vault of this portion of the building, the skill and originality of the tracery of its windows, culminating in the glorious eastern window of world-wide renown, were treated of in detail. In summary, Mr. Kerr expressed the opinion that visits to such a building were of great moment, both to lay and professional students of architecture. The old-world associations, the wondrous rise to prosperity and worldly greatness, the terrible retribution of ruin for laxity and evil—all tell their own tale. Above all, to the truly architectural student there was the thoughtful plan, the careful adjustment of parts, the bold yet skilful detail, the grasp of the capabilities of almost every phase of Gothic style, rare and unstrained originality—especially in tracery—and the whole conception adorned with carvings of remarkable grace and spirit—to educate and delight.

GLASGOW INSTITUTE OF ARCHITECTS.—A general meeting of this Institute was held on the 29th ult. in the rooms, Pitt-street, Mr. John James Burnet, A.R.S.A., F.R.I.B.A., President, in the chair. Mr. C. J. MacLean, writer, secretary, reported the action taken by the Council regarding the Woodside District Halls Competition. They had informed the Corporation that considerable hardship would be inflicted on the competitors if the scheme, on which they had spent their labour on the understanding that the building was to be erected in accordance with the published conditions, should now be altogether set aside, and

(*Continued on page 518.*)

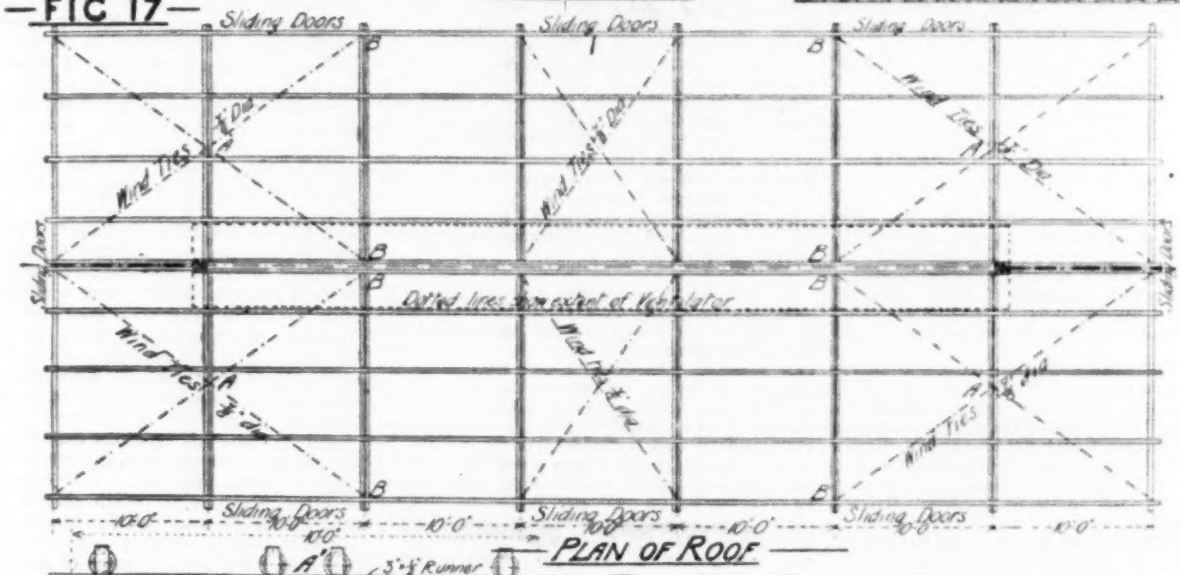
COVERED SHEDS.

FIG 16



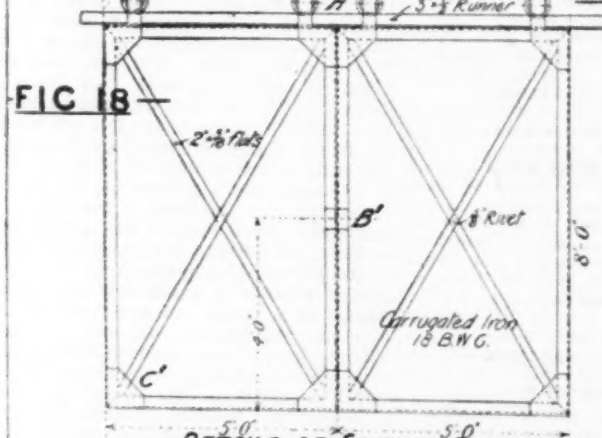
SIDE ELEVATION

FIG 17

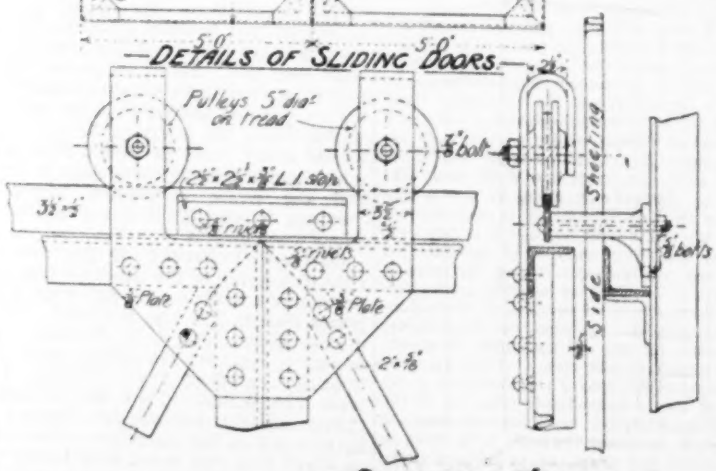


PLAN OF ROOF

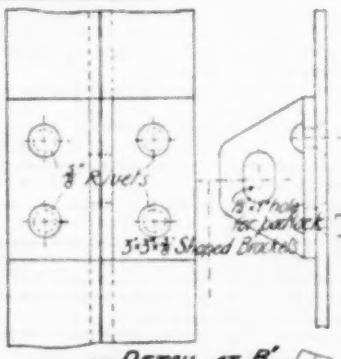
FIG 18



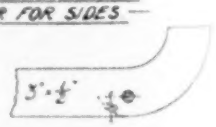
DETAILS OF SLIDING DOORS



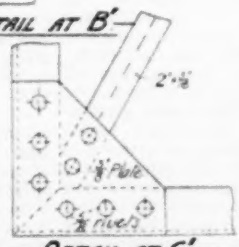
DETAIL AT A'



CAST IRON DISTANCE WASHER FOR SIDES

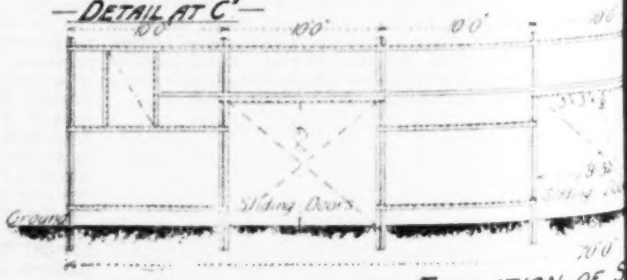


DETAIL AT B'



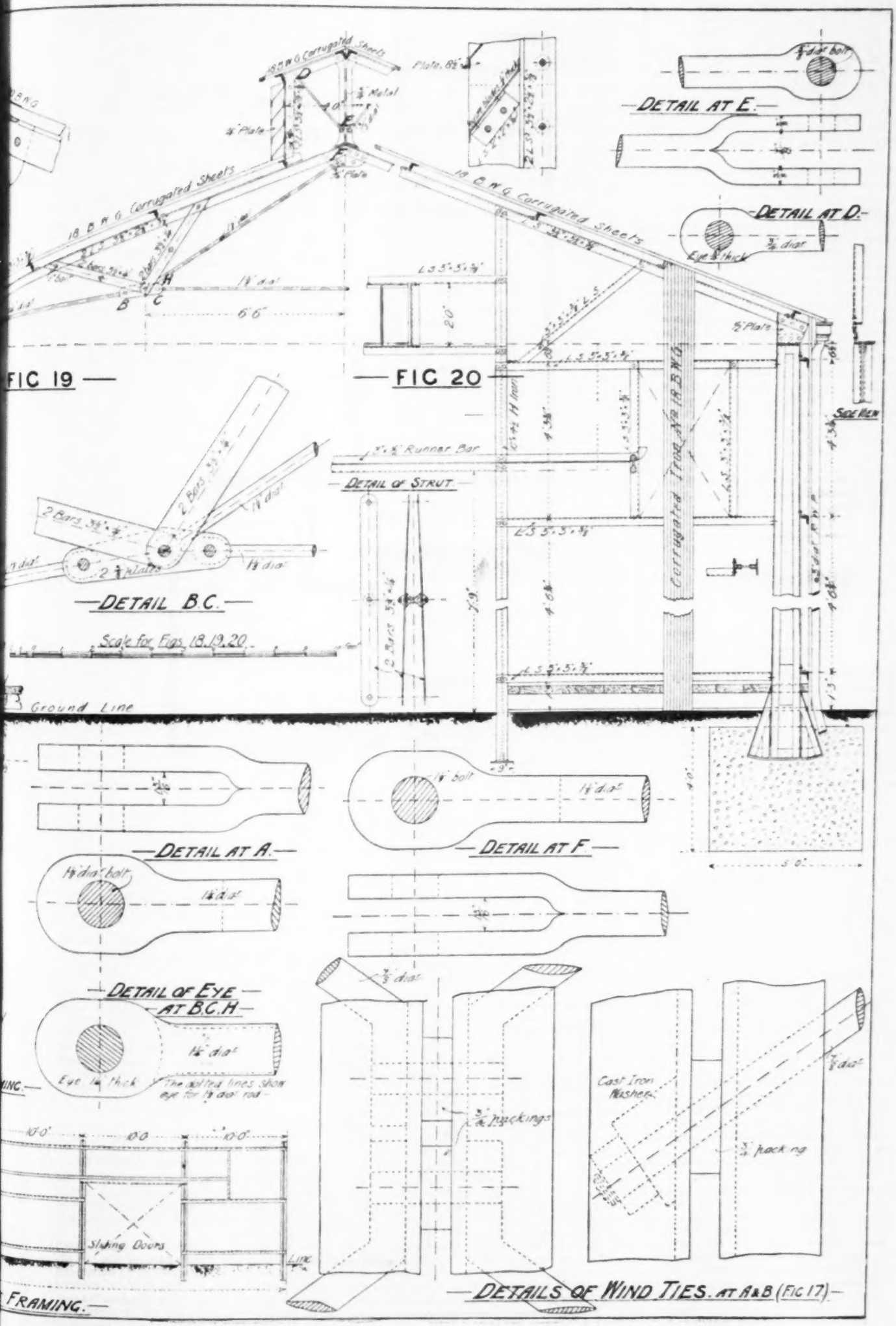
DETAIL AT C'

ENDS OF RUNNER BARS TO ING.



ELEVATION OF S FRA

Illustrations to Paper on Roofing of F Building



Buildings.—Sheet II.

also that in their opinion the competitor whose design in the first competition had been recommended for adoption by the assessors should be employed to design the combined public hall and library.—The President thanked the Institute for having elected him for a second term of office, and while regretting that they had not secured the services of an older member, and one who was better known to their brethren of the Royal Institute, he assured them that with their indulgence he would do his best to fulfil the duties of the office, however arduous they may be, during the coming Exhibition year.

ARCHITECTURAL ASSOCIATION OF IRELAND.—The second technical demonstration of this Society was held on Friday, November 30, at the works of Mr. Edmund Sharp, Great Brunswick-street. Nearly fifty members were present, and followed with the closest attention the remarks of the lecturer. The operation of laying mosaic was performed in their presence from the cutting of the material as received from abroad, and its arrangement of patterns on tracing paper, to its final setting in cement. Several fine specimens of Irish and foreign marbles and other decorative stones having been shown, the party adjourned to the extensive workshops at the rear, where they saw the machinery in action for stone-cutting, punching, turning, steel polishing, and sand polishing. Panels in various stages, from the clay model to completion, were exhibited, the first rough-dressing and much of the initial work being performed by drills and chisels driven by compressed air. At the conclusion of the meeting, which lasted an hour and a half, a hearty vote of thanks was passed to Mr. Sharp for the trouble he had taken in arranging the demonstration.

Illustrations.

DESIGN FOR A WROUGHT-IRON SCREEN.

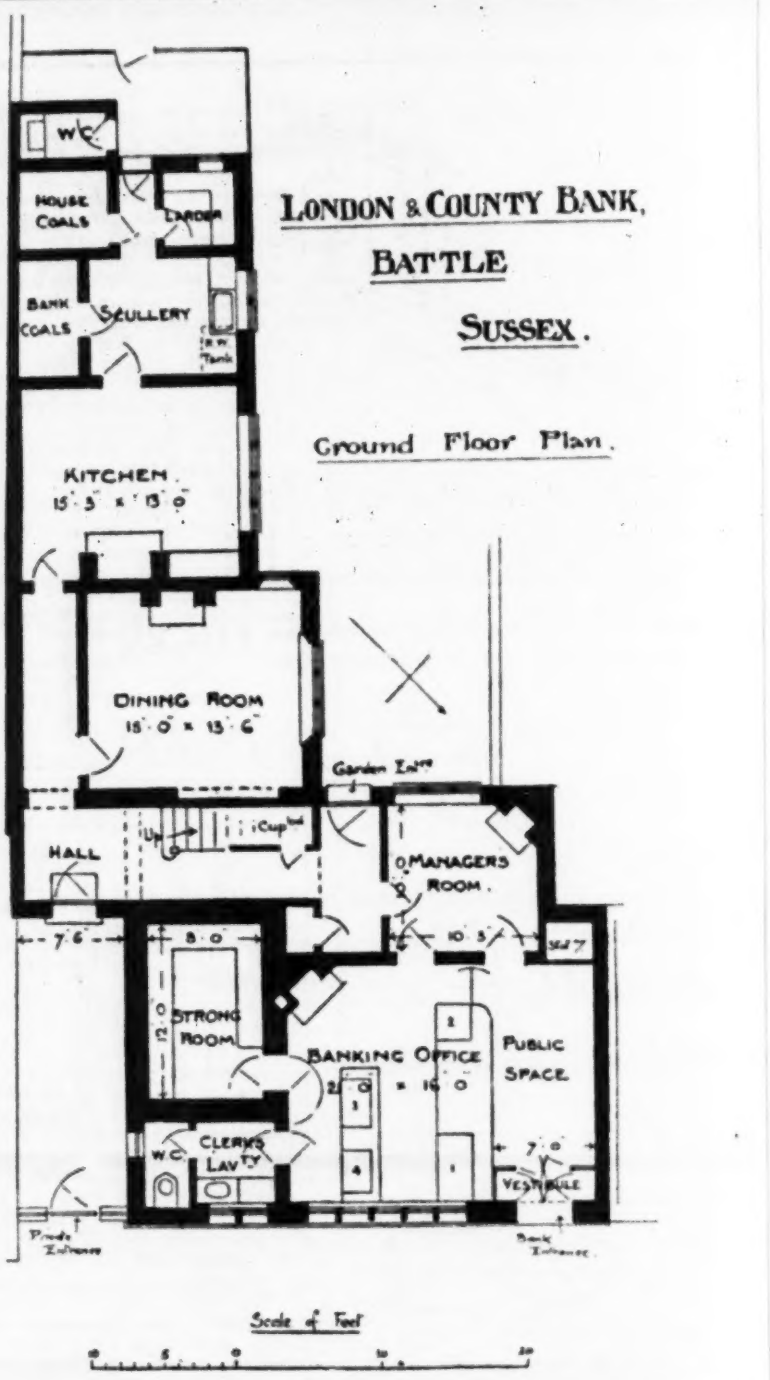
THIS design, by Mr. John J. Shaw (the author of other designs of the same class which have been published in the *Builder*), was exhibited at the last Royal Academy exhibition.

It is a fine example of modern metal-work designed in the Renaissance spirit, and requires no explanation beyond what the drawing itself affords.

OFFICES FOR THE BOARD OF OVERSEERS, LEEDS.

THIS building, No. 5, South Parade, was originally erected about eighty years ago as a private house, but had long been absorbed in the business part of the town and occupied as offices. It was recently purchased by the Leeds Board of Overseers, and altered and adapted to their uses. The walls forming the four offices, vestibule, and staircase, which occupied the front portion of the block, have been swept away, and the whole of the ground floor of this portion is now the Poor Rate office. A new staircase, lavatories, and other offices have been formed at the back, and a board room and committee room on the first floor. A strong room and several large book stores have been built in the basement.

The new front to the ground-floor is built in Portland stone. Messrs. Chas. Myers & Sons, were the principal contractors. The carving was executed by Mr. G. W. Milburn, of York. Messrs. Bagshaw & Sons supplied the steel-work. The tileing to the walls of the rate office and staircase is by Messrs. C. W. Williams & Co., Manchester; mosaic flooring by Rust's Vitreous Mosaic Company; heating by Mr. J. Woffenden; ventilating by the Blackman Ventilating Company; wrought iron gates, railings, and door furniture, and electric light fittings, &c., by Messrs. Elgood Bros., Leicester; the electric lighting by Mr. E. C. Wallis, Leeds; leaded glazing by Mr. Wm. Pape. The counters, desks and other fittings have been made by Messrs. Horsman & Co.; Mr. F. W. Bedford and Mr. S. D. Kitson, of Leeds, were the architects, and Mr. F. L. Stell the clerk of works.



DESIGN FOR PROPOSED CHURCH AT BARNSLEY.

THIS church was designed so that 312 of the congregation should be seated in the nave. The total accommodation required was 400, exclusive of the choir. Two shallow and short aisles on the north and south, close to the chancel, provide room for the additional seating. One of these is arranged so as to be available as a side chapel. The pulpit is placed in that on the north. In this position it would be less difficult to speak than if the preacher were under the high roof of the nave, as the aisle is ceiled at a much lower level; and also the voice would carry further, having the walls of the shallow aisle, rather than the deep space of a chancel, behind it. The sanctuary is 25 ft. wide and 13 ft. deep. The space allotted to the choir is 32 ft. wide, the same as the nave. By this arrangement there is sufficient room for the communicants to approach the sanctuary by the centre and return by the sides. And, also, in keeping the space between the choir benches a full 11 ft. in width, the dignity of the altar and sanctuary are less impaired than would be the case if the furniture of the choir were allowed too much to intervene. The organ is on the south side of the choir, within the tower walls above the clergy vestry. It was proposed that the space at the west, between the porch on the south and the baptistry on the north, should be treated as a narthex, separated from the nave by a screen. On either side of the west porch are small recesses for the use of the vergers, where spare books, &c., might be stored, and notices posted.

The roof of the nave is of wood. Framed principals without tie-beams are carried over in the shape of a pointed arch. These carry the boarded ceiling and the purlins of the outer roof, which are used closely spaced instead of common rafters. Above each window of the clearstory a portion of the pointed barrel-roof is cut away so as to provide for the insertion of the windows under a kind of groined compartment. It was estimated that in brick, with stone dressings, the building would cost about 6,000*l*. H. C. CORLETTE.

TWO COUNTRY BANKS.

LONDON AND COUNTY BANK, ALDERSHOT.

THIS building was erected to replace the old and smaller one which previously stood on this site. It is situated at an important corner in the town, at the junction of Victoria-road and Wellington-street.

The plinth is formed of roughly-hewn granite blocks, the upper part of the fronts being faced with Ancaster stone and Lawrence's red sand faced bricks. The roof is covered with similar red tiles. The window-frames, doors, bank fittings, &c., are all in unpolished teak. Over the bank is a manager's residence on two floors.

The contractors were Messrs. Martin Wells

& Co., of Aldershot, and the cost was about 7,000*l.*

LONDON AND COUNTY BANK, BATTLE.

This branch bank is situated in the High-street, not far from the entrance gates of Battle Abbey. Ham Hill stone is used for the front, with red facings in the upper part. The woodwork and fittings are in unpolished oak. The roofs are covered with local tiles. There is a manager's residence over.

The contractors were Messrs. Eldridge & Cruttenden, of Hastings.

An attempt has been made in each case to design a building suitable for its purpose and, at the same time, in harmony with its surroundings.

The Aldershot bank is in a busy, modern, military town. The Battle one is in a village street, which street contains many relics of the past.

W. CAMPBELL JONES.

ARCHÆOLOGICAL SOCIETIES.

LONDON AND MIDDLESEX ARCHÆOLOGICAL SOCIETY.—The first winter evening meeting of this society was held on Monday, the 26th ult., at the London Institution, Finsbury-circus. Mr. Deputy White presided, and introduced Mr. H. W. Fincham, who read an interesting paper entitled "An Antiquarian Ramble through Clerkenwell." This was done with the aid of lantern illustrations. Views of St. John's Gate and Church and the restored ancient crypt of the Hospital of the Knights of St. John of Jerusalem at the church were shown and described. Various other places of interest were also exhibited and explained by the lecturer, such as Hicks' Hall, the old Baptist's Head, St. Mary's Nunnery, St. James' Church, Red Bull Theatre, House of Detention, House of Correction, New River Head, Sadler's Wells, London Spa, and Bagnigge Wells. Portraits of old celebrities were also shown, such as Thomas Britton, known as "the musical small-coal man," who at his own expense maintained musical soirées at his house for forty years. Mr. George Potter, of Highgate, exhibited a number of relics of the small-coal man, including a sale catalogue of his library (1694 and 1716), a deed relating to some adjoining property (1687), and a book plate and sale catalogue (1714) of Dr. Gilbert Burnet, of St. John Square, Clerkenwell.

METROPOLITAN ASYLUMS BOARD.

THE fortnightly meeting of this Board was held at the Board's offices, Thames Embankment, on Saturday, Sir E. Galsworthy presiding.

The Works Committee, reporting with regard to Leavesden and Darenth Asylums, at which it was proposed to erect female attendants' homes, expressed the opinion that the work should be carried out by an outside firm of architects, and recommended that Messrs. Newman & Newman, of Tooley-street, be appointed in that capacity at a commission at the rate of 4 per cent. on the total cost of the works to be carried out under their supervision.—This was agreed to.

With regard to the Western Hospital, the Works Committee submitted a statement showing the estimated and the actual cost of three diphtheria blocks, six isolation blocks, two staff blocks, and the engineering works in connexion therewith at this hospital. The original estimate stood at 59,521*l.*, while the actual cost had been 56,964*l.* This report was adopted.

THE "FRIEZE OF THE ATTIC MONTHS."—By a printer's error in the description of Mr. Babb's design in our last issue, the name of the Greek Bacchus appeared as "Dionysius"; it should of course have been "Dionysus."

THE NATIONAL PHYSICAL LABORATORY.—At the anniversary meeting of the Royal Society on November 30 last it was announced that the executive committee of the general board of the National Physical Laboratory will shortly be placed in possession of Bushey House, at Kew, the Queen having signified her sanction to an assignment of the lease of that house with 30 acres of surrounding land for purposes of the laboratory work. The Government will increase the building grant by 2,000*l.*, and the adaptation of Bushey House, together with the new buildings, will be proceeded with forthwith. The committee reported that in their opinion two buildings should be erected, and at some distance from one another, to constitute separate physics and engineering laboratories. For particulars concerning the geological nature of the ground at disposal we may refer our readers to the "Note" in our issue of July 29, 1899.

THE SANITARY INSPECTORS' ASSOCIATION:

OVERCROWDING IN DOMESTIC DWELLINGS.

AN extraordinary general meeting of the Sanitary Inspectors' Association was held on Saturday evening at the Carpenters' Hall, London Wall, E.C., Mr. W. H. Grigg, Chairman, presiding.

Mr. F. W. Morley read a paper upon "Overcrowding in Domestic Dwellings." He said that of the many and varied duties of the public health officials the prevention of overcrowding was one of the most important, and such overcrowding was most difficult to detect, and when detected, was difficult satisfactorily and permanently to abate. From whatever point the investigations were commenced, and whatever course were taken in search of a remedy, the conclusion arrived at would be that the great obstacle in the way of an efficient and final remedy was the unsatisfactory state of the land laws; and however elaborate the legislation, and however efficient its application, it would simply be an attempt to achieve the impossible until means were adopted to spread the population over a larger area by rendering the land more cheaply and easily available for building purposes, and by affording cheap, ample, and comfortable means of transit. One outcome of the attempt at a solution was seen in the various blocks of model dwellings which had become a feature in the majority of our large cities. While these dwellings answered to a great extent the purpose for which they were erected, one could not but feel that there was something radically wrong with our social system which rendered it necessary to crowd such a large number of persons upon a given area, when within a comparatively short distance large tracts of land were to be found vacant and of very little use; and there were certain objectionable features in connexion with this method of piling humanity upon humanity's head which should, if possible, be avoided. Another suggestion, which had much to recommend it, was the removal of factories from towns into rural districts, but in order to carry out this with any prospect of success it was absolutely imperative that there should be proper provision for the prompt and economical transport of the raw material to the factories and the manufactured article into the market. The powers conferred upon sanitary authorities to deal with overcrowding would appear to be sufficient if they were fully utilised and vigorously enforced. Section 94 of the Public Health Act, 1891, required that every sanitary authority shall make and enforce such by-laws as were requisite for fixing the number of persons who might occupy a house which was let in lodgings or occupied by persons of more than one family. In view of the roving tendency of many of the working-class families, the efficient application of such by-laws would call for the utmost watchfulness on the part of the official entrusted with their administration, and to attain to anything like efficient supervision would tax to the utmost the energies of a very much larger number of officials than were at present employed; in addition to which the public, whatever their social position, were apt to resent any intrusion into their homes, and to uphold the sentiments expressed in the old adage, "An Englishman's home is his castle;" and therefore a considerable amount of tact and patience was often called for in order to obtain the required information. Again, where overcrowding did actually exist, all kinds of scheming was resorted to in order to evade the law. Another fact against them was that they were dealing with living, reasonable, beings, and therefore they could not move them here and there at their own will; and this demonstrated the great importance of the education of the people in at least the elementary principles of public health. Every one entered the world with an instinctive craving for a decent and healthy surrounding, but whether this was developed and fostered, or to a great extent nullified, depended very largely upon the conditions under which we lived during the earlier years of our lives. Under these circumstances the education of the people in what might be termed the theory of health was capable of giving very material assistance in the solution of the question. To begin with, too much importance cannot be attached to the teaching of hygiene in schools of all classes, and no child's education should be considered complete without the knowledge being instilled that overcrowding had a very detrimental effect upon the general health. To those whose school days had passed, every opportunity should be taken to advise and counsel, and there was no body of individuals who had better opportunities than the sanitary inspectors of imparting information where and when it was most needed. The special training and examination through which the majority of would-be sanitary inspectors had to pass combined to evolve officials whose discretion, tact, and ability might be relied upon, and who might safely be trusted with still larger powers to enable them to deal with many evils which were a menace to the health and well-being of the community. As a case in point, when plans of proposed dwelling-houses were submitted to the Authorities for approval, there should be included a definite statement as to the numbers the proposed buildings were intended to accommodate, and sanction should be given on the express condition that the number should be strictly adhered to; such particulars should be included in the lease, and also fixed in such a position on the premises as to be visible to the occupants, and any one causing such number to be exceeded should be summarily dealt with. The suggestion that directly a given area was declared insanitary, any fresh removals into the said area should be prohibited, was worthy of consideration. There were many other measures of reform which might be enumerated; among others, the extension of time for the repayment of capital borrowed under the Housing of the Working Classes Act to 80, 90, or 100 years, and in the case of compensation the amount should not exceed the actual value of the land, with a reduction in the shape of a penalty for neglecting to keep the property in question in a sanitary condition, thereby removing the inducement to owners to allow it to fall into a dilapidated and otherwise insanitary condition, in order to get the authorities to acquire it by compulsion, and paying heavy compensation for the acquisition. Briefly, in conclusion, the following were some of the methods which appeared to be capable of playing their part in the solution of the question:—The provision of ample means of transit; the removal of factories from town to country; the erection of ample and suitable dwellings; the full use of the powers conferred by the Public Health Act, the Housing of the Working Classes Act, &c.; the teaching of hygiene in public schools; and the taxation of the land in order to create a fund to be utilised in cheapening the cost of the provision of suitable dwellings.

Mr. Warwick moved a vote of thanks to Mr. Morley, and said that overcrowding could not possibly be prevented until every man was paid a fair wage. It was a distressing and disgusting thing that in London there were 1,400 single rooms occupied by families of from four to eleven persons.

Mr. Dee, who seconded the motion, mentioned that he did not know an instance of people who had been displaced from an insanitary area being rehoused upon the same place; they always went and overcrowded another district.

Mr. Baxter said that much of the present state of things was due entirely to public apathy. The small amount of interest which a large section took in matters of vital importance to them was really astonishing.

Mr. West observed that they were not likely to get rid of the overcrowding question until the millennium. The principal way, however, of remedying the present condition of affairs was to educate the people.

The motion was carried.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring-gardens, Alderman W. H. Dickinson, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee it was agreed to lend Kensington Borough Council 500*l.* for the Silver-street improvement; and Islington Guardians 10,000*l.* for erection of an infirmary at Highgate Hill.

Drainage of Coldharbour: Diversion of the Isle of Dogs Branch Sewer.—The Main Drainage Committee brought up a report containing the following recommendations, which were agreed to:—

"(*a*) That the estimate of 22,330*l.*, submitted by the Finance Committee, in respect of the drainage

of Coldharbour be approved; and that a further expenditure of 6,045*l.* be sanctioned for the purpose of completing the diversion of the Isle of Dogs branch of the northern low-level sewer, in accordance with the Council's resolution on November 21, 1899.

(*b*) That the proposed new sewer and other incidental work for the drainage of Coldharbour, together with the work of diverting the Isle of Dogs branch sewer, between the junction of Manchester-road with East Ferry-road, Isle of Dogs, and Yabsley-street, with the exception of the portion underneath the southern entrance to the West India Docks and other adjoining dock property, be carried out without the intervention of a contractor, and that the drawings, specification, and estimate of the cost (23,425*l.*, including 1,500*l.* as provision money for extra works) be referred to the Manager of Works for that purpose.

(*c*) That the tender of Messrs. Clay, Henriques, & Co., amounting to 1,401*l.*, for the manufacture, delivery, and erection of nine penstocks required for the drainage of Coldharbour and the diversion of the Isle of Dogs branch of the northern low-level sewer, be accepted; that the solicitor be instructed to prepare the contract; and that the seal of the Council be affixed to the contract when ready."

Mr. Easton asked why it was that it was recommended that the work should be sent to the Works Department at a cost of 23,000*l.*, when the estimate of the engineer was 16,000*l.*

Mr. Ward said that the engineer's estimste was a low one, and the Works Department refused to accept it. Then the work was put to tender, and several tenders were received. The only one which it was possible for the Council to accept on account of the price could not be accepted for reasons which he could not go into.

Improvement Estimates.—The Improvements Committee recommended that the estimates of 120,000*l.*, 13,500*l.*, 7,000*l.*, 15,000*l.*, and 9,100*l.*, amounting in all to 164,600*l.*, in respect of the paving and other works for the following improvements:—Holborn to the Strand street; Southampton-row; Wandsworth-road, Lambeth; Kensington High-street; and Cat and Mutton Bridge, Shoreditch, should be approved.

The recommendation was adopted without discussion.

Colonel Ford asked whether the Improvements Committee had considered the seriously congested state of the Strand in connexion with the construction of the new street from Holborn to the Strand. He would like to know when the Committee had communicated with the Police, and whether the new street would relieve the traffic in the Strand, or cause it to become more congested than now.

Dr. Longstaff said the Committee had considered the question. They had not communicated with the Police, but they believed that the traffic would be relieved when the improvement was carried out.

Rebuilding of Lambeth Bridge.—The Bridges Committee brought up a Report dealing with Lambeth Bridge, and recommended that the bridge be rebuilt.

The Chairman said the Report was not in order, as it had not been submitted to the Finance Committee.

Mr. Crooks (Chairman of the Committee) asked if he could move the second paragraph of the Report, which dealt with the type of the suggested new bridge. If he was in order, he would ask leave to substitute for the recommendation in the paragraph the following words:—"That a design be submitted for a five-arched granite-faced concrete bridge." That would pledge the Council to nothing, but it would enable the Committee to go to the Finance Committee with a design of the bridge for which they asked the money.

The Chairman said he saw no good purpose to be served in moving the paragraph.

Mr. Crooks said he was anxious to get the opinion of the Council as to the class of bridge it desired, and as he understood he was in order, he should move the paragraph. They had only just had an idea of the superior character of the German cement. The Germans had brought in the chemist to assist the engineer, and had discovered a material which must be of great advantage and come into great use in this country. It did seem a little ironical that a great cement-producing country like England should have to go to Germany for the information they had now got. The Committee were practically unanimous that it would be an advantage to London if they had a granite-faced concrete arch as suggested.

Colonel Rotton moved, as an amendment, that a design for a steel five-arched bridge be submitted. They had a magnificent example of such a bridge in Westminster Bridge, and he was anxious that they should have a replica of Westminster Bridge. It was ridiculous to say that they could not in England build their own bridges with their own stuff.

Mr. Verney said that there was a great deal to be said for suiting a bridge to its surroundings. A concrete bridge might be much more suitable to the surroundings of Lambeth than the Gothic style of Westminster Bridge, which was so admirably suited to its own position. Some of the bridges over the Thames were national disgraces, which he hoped the Council would not repeat. There were many people who would like to have a replica of Waterloo Bridge, which was infinitely finer than any other Thames bridge, even including Westminster Bridge.

On the motion of Mr. R. A. Robinson, seconded by Mr. Howell Williams, the further consideration of the matter was adjourned until the Finance Committee had reported on the financial aspect of the reconstruction of the bridge.

Register of Council's Property.—The Corporate Property Committee asked the Council to sanction the preparation, at a cost not to exceed 500*l.*, during the year ending March, 1901, of a complete single register with plans showing all the property, permanent and temporary, handed over by the late Metropolitan Board of Works and other authorities and subsequently sold or leased by the Council, together with an exact record of its utilisation.

An amendment to refer the recommendation back was rejected, and the recommendation was adopted.

Parliamentary Bills.—Mr. Cornwall moved the reception of the Report of the Parliamentary Committee, which dealt with the London County Council (General Powers) Bill, the Tramways and Street Widenings Bill, the Spitalfields Market Bill, and the Thames Piers and River Service Bill. The Committee also proposed, next week, to bring up the Bill for the Purchase of the Water Companies, and the Bill dealing with Sterilisation Clauses. These would be the whole of the Bills to be promoted by the Council in the next Session of Parliament.

The Report was adopted.

Applications under the Metropolis Management and Building Acts Amendment Act, 1878.—The Theatres and Music Halls Committee agreed to applications under the Metropolis Management and Building Acts Amendment Act, 1878, for arrangements at the following places:—Alexandra Theatre, Stoke Newington (Mr. F. Matcham); Camden Theatre, Camden Town (Mr. W. G. R. Sprague); Duchess Theatre, Balham (Mr. W. G. R. Sprague); Gambrinus Restaurant, Glasshouse-street (Mr. R. H. Kerr); Great Queen-street Theatre (Mr. J. Murray); Hanley Hall, Sparsholt-road, Crouch Hill (Mr. J. G. Abraham); Palace Theatre of Varieties, Greenwich (Mr. F. Harper and Mr. E. E. Fetch); London Pavilion (Messrs. Wylson and Long); Paddington Baths (Mr. E. B. B. Newton); Royal Agricultural Hall (Mr. R. Venner); Royal Aquarium (Mr. J. W. Wilkinson).

St. Martin's-lane Theatre.—It was agreed to sanction the plans submitted by Mr. F. Matcham in regard to a theatre to be erected in St. Martin's-lane, on certain conditions.

Government Buildings.—Mr. Burns, M.P., suggested that, in regard to the new Land Registry Office in Lincoln's Inn-fields, a conference between the Architect of the Council, the First Commissioner of Works, and Sir Kenneth Mackenzie should take place with respect to the encroachment of which he complained last week. He believed that harmonious action in this matter was possible, and that the Government would be glad to co-operate.

The Chairman of the Building Act Committee said he would put the suggestion before his Committee.

Tender.—The Highways Committee recommended, and it was agreed, that the tender of Messrs. R. S. Newall & Son, for the supply, for the sum of 236*l.* 12*s.*, of a steel cable, 9,400 ft. in length, for the Streatham cable tramways, be accepted; that the solicitor do prepare the necessary contract to give effect to the tender.

Working Class Dwellings, Clerkenwell.—The Housing of the Working Classes Committee recommended that the two estimates of 500*l.* each submitted by the Finance Committee for preliminary expenses in connexion with the erection of working-class dwellings on the Reid's Brewery site, Clerkenwell, be approved, and that the Housing of the Working Classes Committee be authorised to incur expenditure within the amounts of the respective votes. This was agreed to and the Council adjourned.

APPLICATIONS UNDER THE 1894 LONDON BUILDING ACT.

AT the meeting of the London County Council on Tuesday the following applications under the 1894 Building Act were considered. Those applications to which consent has been given are granted on certain conditions. Names of applicants are given in brackets. Buildings are new erections unless otherwise stated:—

Lines of Frontage.

Clapham.—A one-story shop upon part of the forecourt of No. 258, Wandsworth-road, Clapham (Mr. W. H. Choules for Mr. W. Thrower).—Consent.

Dulwich.—An additional porch at the South London Tabernacle, Peckham-road, Camberwell (Mr. J. Wills for Mr. W. H. Powell).—Consent.

Kennington.—That the application of Mr. J. P. Bayly on behalf of the Commanding Officer of the 3rd Middlesex Volunteer Artillery, for an extension of the period within which the erection of a one-story addition to the drill-hall, No. 76, Lower Kennington-lane, Kennington, to abut upon Reedworth-street, was required to be commenced, be granted.—Agreed.

Lewisham.—The retention of a building, to be used as a surgery, at the rear of No. 35, Laleham-road, Lewisham, to abut upon Carswell-street (Mr. H. J. Bate for Dr. G. P. Hulbert).—Consent.

Lewisham.†—A conservatory at the side of Stanstead-lodge, Catford, to abut upon Northwood-road, to an advanced line of frontage, also the erection of a raised landing with a wooden balustrade, in front of such premises (Mr. G. Tolley for Mr. H. Gardner).—Consent.

Peckham.—A one-story shop on part of the forecourt of No. 188, Rye-lane, Peckham (Messrs. Dowton & Druery for Messrs. Cooper & Budd, Limited).—Consent.

Rotherhithe.—That the application of Mr. A. C. Forrester for an extension of the period within which the erection of an addition, with a one-story porch in front, to the Presbyterian church on the west side of Southwark Park-road, Bermondsey, was required to be commenced, be granted.—Agreed.

Woolwich.—Three houses on the south side of Nithdale-road, Plumstead, and one house on the east side of Eglington-road, to abut upon Nithdale-road (Mr. A. E. Habershon for Mr. J. Stevens).—Consent.

Hackney, Central.—A one-story addition to Sussex Cottage, No. 10, Kenninghall-road, Upper Clapton, to abut upon London-road (Mr. S. A. Smith for Mr. M. Smith).—Refused.

Islington, North.—A warehouse building on the north-west side of Windsor-road, Holloway-road, Islington (Mr. R. Midworth for Mr. J. G. Wootton).—Refused.

Lewisham.†—A dwelling-house, with bay-windows, on the south side of Sydenham Park, Sydenham, next No. 30 (Mr. G. Tolley for Mr. E. C. Christmas).—Refused.

Lewisham.—One-story shops on the forecourts of Nos. 112 and 114, Lee-road, Lee (Mr. A. Tyler).—Refused.

Peckham.—Four houses with bay-windows, on the south side of Reynolds-road, Pechham Rye, Peckham (Mr. A. Wood).—Refused.

Projections.

Greenwich.—An iron and glass shelter over the entrance to Morton's Theatre, London-street, Greenwich (Mr. A. Roberts for Mr. A. Carlton).—Refused.

Marylebone, West.—The re-erection of the balcony at the first floor level in front of No. 42, Montagu-square, St. Marylebone (Mr. F. W. Hunt for the Honourable Miss Powys).—Refused.

Width of Way.

City of London.—Buildings on the site of Nos. 20, 22, 24, and 26, Copthall-avenue, London-wall, City, at less than the prescribed distance from the centre of the street (Mr. R. B. Marsh for the City of London Real Property Company, Limited).—Consent.

Haggerston.—An addition to the rear of Nos. 50 to 62, Kingsland-road, Shoreditch, at less than the prescribed distance from the centre of Union-walk (Messrs. Ford, Son, & Burrows for Messrs. J. Carter & Sons, Limited).—Consent.

Westminster.—A variation from the plan approved for the rebuilding of No. 29, Great Chapel-street, Westminster, at less than the prescribed distance from the centre of Dacre-street, so far as relates to the erection to a greater height of a portion of the building (Mr. P. H. Nowell).—Consent.

Rotherhithe.—A warehouse building on the south side of St. Thomas-street, Rotherhithe, at less than

the prescribed distance from the centres of Great Maze Pond and Maze Pond-terrace (Mr. P. Currey for Messrs. Tebbitt Brothers).—Consent.

St. George, Hanover-square.—A one-story building on the north side of Hay Hill, St. George, Hanover-square, at less than the prescribed distance from the centre of South Bruton-mews (Mr. B. Slade for Mr. W. M. Pegge)—Refused.

Deviation from Certified Plan.

St. George, Hanover-square.—Certain deviations from the plan certified by the District Surveyor, under Section 43 of the Act, so far as relates to the proposed rebuilding of No. 1, Berkeley-square, St. George, Hanover-square, at the corner of Hay Hill (Mr. R. G. Hammond for Mr. J. Garlick).—Consent.

Space in Rear.

Greenwich.—A modification of the provisions of Section 41 (i.) (vi.) with regard to open spaces about buildings, so far as relates to the proposed erection of a dwelling-house on the east side of Horn-lane, Woolwich-road, Greenwich, at the corner of a right-of-way leading to the rear of houses on the north side of Woolwich-road, with an irregular space at the rear (Mr. H. Congdon)—Consent.

Lines of Frontage and Width of Way.

Finsbury, East.—The rebuilding of No. 55, Cow-cross-street, Holborn (Mr. E. W. Mountford for Mr. H. Pocock)—Consent.

St. George, Hanover-square.—A porch, bay window, and balcony to No. 1, Berkeley-square, St. George, Hanover-square (Mr. R. G. Hammond for Mr. J. Garlick)—Consent.

Woolwich.—Nine dwelling-houses on the west side of Red Lion-lane, Shooter's Hill, Plumstead, such dwelling-houses and the forecourt fences in front thereof to be within the prescribed distance from the centre of Red Lion-lane (Mr. A. E. Parnell for Mr. J. Sanford).—Refused.

Width of Way and Space at Rear.

Hampstead.—Residential flats on the west side of Grove-place and the south side of Christchurch-road, Hampstead (Mr. W. P. Horton for H. Marnham).—Consent.

Lines of Frontage, Space at Rear, and Width of Way.

Lambeth, North.—Buildings on the site of Nos. 136 to 146 (even numbers only), Kennington-road, Lambeth, with projecting porches, balconies, and four-story bay-windows, also the erection of a building on the site of Nos. 67 and 68, Walnut-tree Walk (Messrs. Waring & Nicholson for the Trustees of the Lambeth Walcot Charity Estate)—Consent.

Chelsea.—A block of residential flats on the south-west side of Park Walk, Chelsea, at the corner of Chapel-street (Mr. C. W. Stephens for the Metropolitan Industrial Dwellings Company)—Refused.

Lewisham.—A workshop and scenic studio at the rear of No. 25, Upper Winchester-road, Catford, to abut upon Blythe Hill-lane (Mr. S. J. Smith for Mr. H. Mapleson).—Refused.

Lines of Frontage and Construction of Buildings.

Peckham.†—A screen wall on the forecourt of No. 18, Rye-lane, Peckham (Messrs. Williams & Co. for Miss P. Revett)—Consent.

Hampstead.—A greenhouse, forcing-house, heating-chamber, and verandah in the garden at the rear of No. 27, Arkwright-road, Hampstead, to abut upon Frognal (Mr. A. R. Henderson for Mr. J. Mackay)—Refused.

Formation of Streets.

Woolwich.—That an order be issued to Mr. F. E. Windsor sanctioning the formation or laying out of a new street for carriage traffic to form a continuation of Francis-street into Flaxton-road, The Slade, Plumstead (for Mr. H. N. Grenside). That the name Francis-street (in continuation) be approved for the new street.—Agreed.

Wandsworth.—That an order be issued to Messrs. Turtle & Appleton sanctioning the formation or laying-out of two new streets for carriage traffic in continuation of Huntsmoor-road and Podmore-road respectively, East Hill, Wandsworth. That the names Huntsmoor-road (in continuation) and Podmore-road (in continuation) be approved for the new streets.—Agreed.

Cubical Extent.

Hammersmith.—The retention on the east side of Fulham Palace-road, Hammersmith, of a building to exceed in extent 250,000, but not 450,000, cubic feet, and to be used only for the purposes of a tobacco factory and offices. (Mr. H. W. Peck for Messrs. A. I. Jones & Co., Limited).—Consent.

The recommendations marked † are contrary to the views of the Local Authorities.

"THE STUDENT'S COLUMN."—Our Student's Column article ("Lessons in Electrical Engineering") is unavoidably held over until next week.

EPISCOPAL CHURCH, NIDDRIE, EDINBURGH.—The memorial stone of Niddrie Episcopal Church was laid on the 30th ult. Mr. John Robertson, of Inverness, is the architect.

Correspondence.

To the Editor of THE BUILDER.

SAXON CHURCHES.

SIR,—I, in common with the ever-increasing army of appreciative amateurs in regard to our oldest British architecture, express extreme gratitude to you for publishing, and to Professor Baldwin Brown for writing, the delightful articles just regretfully closed.

I am writing to convey a suggestion, if you will permit me, and I feel sure it is one that Professor Brown will be able and probably willing to comply with, and yet such as you by your generosity could easily place within the reach of the whole of us. It is this: To publish in a given number or numbers of the *Builder* a complete list, divided into the various districts, of all the churches, with a suggestion of the nearest available place to get at to reach them. The mere mention of a town in the following form would do:—

"Worth, Sussex. Station: Three Bridges."

T. H. HOLLING, M.R.I.A.S.

*** If Professor Baldwin Brown is willing to take the trouble to make out such a list, we shall of course be happy to publish it.—ED.

BOOKS RECEIVED.

WORCESTER: THE CATHEDRAL AND SEE. By Edward F. Strange. (Geo. Bell & Sons.)

THE CHURCHES OF ROUEN. By the Rev. Thomas Perkins. (Geo. Bell & Sons.)

GODALMING AND ITS SURROUNDINGS. By T. F. W. Hamilton. (The St. Bride's Press.)

WEEK-ENDS IN DICKENS LAND. An illustrated handbook. By Duncan Moul. (The St. Bride's Press.)

THE "PRACTICAL ENGINEER" ELECTRICAL POCKET-BOOK, 1901. (Technical Publishing Co., Manchester.)

GENERAL BUILDING NEWS.

ST. STEPHEN'S CHURCH, WESTBOURNE PARK.—The chancel of this church has been extended, the pulpit has been moved into a better position, the organ rebuilt in the south chancel aisle, and the north chancel aisle converted into a morning chapel, and a sanctuary added. The glass of the two memorial windows in the south wall of the south chancel aisle has been refixed in the apse of the chapel, and that from the end window in the tower window. The old vestry, which had to serve both for clergy and choir, has been lengthened, and is now the priest's vestry, and a new one has been built for the choir, with an entrance into the north transept. A new porch has been built outside the doorway to the south chancel aisle, and screens provided in the present south porch and tower. The entrance doors have been made to open outwards instead of inwards. The font, which formerly blocked the main passage, has been moved into the south aisle. The gallery staircase, which was dangerous, has been rebuilt, and proper landings provided in lieu of the winders and the doors made to open outwards. The chancel roof and roof of the apse to the chapel have been ceiled inside with boarding and divided into panels with moulded ribs. The whole of the church will be lighted by electric light. The new work is faced externally with Kentish ragstone to match the old work, and the new external masonry is all in Doulting stone. The internal masonry is in Bath stone. The steps and paving in the new part of the chancel are marble. The aisle roofs have been stripped and reslated, and the building generally repaired and the walls repointed. The works, excepting the reredos and altar (which have been executed by Mr. Pippet, of Solihull), have been carried out by Mr. W. Potter, of Croydon, from the designs and under the superintendence of Messrs. W. & C. A. Bassett Smith, of Adelphi. The electric lighting has been carried out by Messrs. Hayward Tyler, of London.

RESTORATION OF ST. MARY'S CHURCH, USK, MONMOUTHSHIRE.—St. Mary's Church, Usk, has just been partly restored. The walls have been stripped of the plaster which covered them, and the Norman stonework has been revealed. An organ, which was, until recently, in Llandaff Cathedral, has been rebuilt in the church by Messrs. Vowels, of Bristol. The work has included a new oak ceiling, and has cost about 1,200*l*. The restoration, which will eventually include the tower and screen, has been carried out under the direction of Mr. G. E. Halliday, of Cardiff. Messrs. George Couzens & Co. were the contractors.

PRESBYTERIAN CHURCH, WEST HARTLEPOOL.—A new Presbyterian church, with a hall, classrooms, and caretaker's house, has just been completed from designs by Messrs. Badenoch & Bruce, architects, of Newcastle-on-Tyne. The buildings are of brick with stone dressings, the principal front being faced with red pressed Commondale bricks. The block facing Sandringham has entrance-hall, staircase with lavatory accommodation, secretary's room, library, and a large infant classroom on ground floor; session-room, ladies' room, lavatories, and access to hall gallery on the first floor. The stairs are fireproof. The hall is placed behind the front block. It is about 51 ft. long by 39 ft. wide, and 25 ft. high to ceiling, having a gallery at one end. The roof is open-timbered, and is of selected pitch-pine. Behind the hall a corridor leads to a kitchen for tea meetings, with heating chamber under, and a back exit to Angus-street. The lighting is by electricity, with supplementary gas jets for emergencies. The general contractor is Mr. William Pearson, of West Hartlepool, the heating apparatus is by Messrs. Dinning & Cooke, the electric lighting by Messrs. Thomas G. Usher & Co., and the lead glazing by Messrs. Atkinson Bros., all of Newcastle-on-Tyne.

BOARD SCHOOLS, LONG EATON, DERBYSHIRE.—The new buildings, erected at a cost of about 7,000*l*. to augment the accommodation at the Derby-road Board Schools, Long Eaton, were opened on the 27th ult. Land having been purchased adjoining the existing schools in Derby-road, the new block of buildings, to accommodate 360 scholars, has been erected, besides a swimming bath, kitchen for cookery classes, and suite of rooms for the local pupil teachers' centre. The new buildings comprise six classrooms, each to accommodate sixty, and a room capable of accommodating 120, which can be converted into two classrooms by means of sliding doors. The swimming bath is 50 ft. by 24 ft., and the depth (for children) 4 ft. 6 in., rising to 3 ft. 2 in. at the shallow end. The depth is capable of being increased for adults by 18 or 20 inches. Messrs. Youngman & Son, of Long Eaton, were the contractors, the architect being Mr. E. R. Ridgway, also of Long Eaton.

SCHOOL BOARD OFFICES, GRIMSBY.—The foundation-stone of the new School Board Offices, which are being erected in Eleanor-street, near to the Higher Grade School, was laid on the 29th ult. The work is to be carried out, under the supervision of the architect, Mr. H. C. Scaping, by Messrs. Hewins & Goodhand. The structure will be composed of two stories, the ground floor being taken up with general offices, the clerk's private office, manual instruction-room and a drawing-room in connexion with the class in ironwork. The board-room will occupy the second floor, together with a members' retiring-room, while the caretaker's house will adjoin the main building.

BOARD SCHOOL, CHESTERFIELD.—On the 29th ult. the foundation stones of a new Board School were laid at Chesterfield. The new school is being erected in Old-road, to meet the growing requirements of the West Ward. Its frontage will be towards Old-road, and it will accommodate 500 infants. The building will be 132 ft. long by 69 ft. wide, and will have a central hall 80 ft. by 25 ft., surrounded by classrooms. The cost of the school, with the caretaker's house, will be 5,671*l*. Mr. W. Rhodes is the builder, and Mr. W. C. Jackson, the architect.

ENLARGEMENT OF INFECTIOUS DISEASES HOSPITAL, LANGLEY PARK, DURHAM.—This hospital is to be enlarged, at a cost of 2,000*l*. Plans have been prepared by Mr. George T. Wilson, of Blackhill.

CASUAL WARDS, SELLY OAK, WORCESTERSHIRE.—The casual wards which have been erected in Oak Tree-lane, Selly Oak, in connexion with the King's Norton workhouse, were opened on the 28th ult. The wards are on the cellular system; twenty-five for men and twelve for women. The cost has been about 6,000*l*. Mr. Cooper Whitwell was the architect, and Messrs. B. Whitehouse & Sons were the contractors.

NEW WARDS, LEEDS WORKHOUSE INFIRMARY.—The new imbecile wards at the Leeds Union Workhouse, Beckett-street, were opened on the 29th ult. The buildings which have just been opened consist of a detached pile erected near to the northern boundary of the workhouse grounds. They are of red brick, and have been built from the designs of Mr. J. Mitchell Bottomley, architect, Leeds. There are three distinct blocks, connected with one another by covered corridors. The centre block is for administrative purposes, and is a single story high. The main entrance and exits are in it, also the receiving wards, the padded rooms, the waiting-room, the dining-room, kitchen, and officials' apartments. The flanking blocks are each two stories high, for the reception of the male and female patients respectively. The connecting corridors are of sufficient width, and are broken by bay windows to allow of their utilisation as day rooms. In case of fire the buildings are provided with outside iron staircases. A sum of 10,500*l*. has been spent on the scheme, exclusive of the furnishing, which has cost an additional 1,500*l*. Mr. W. Airey was the contractor for the brick and wood work.

ARCHITECTURAL ASSOCIATION DISCUSSION SECTION.—Our report of the third meeting of the Discussion Section of the Architectural Association on the 30th ult., when Mr. F. G. W. Buss read a paper entitled, "Is the Quantity Surveyor a Necessity?" is unavoidably held over until next week.

A PORTRAIT OF SIR CHARLES BARRY.—The trustees of the National Portrait Gallery have lately received a portrait of Sir Charles Barry, R.A., painted by J. P. Knight, R.A. The portrait is a gift to the gallery from his son, the Right Reverend Dr. Barry, Rector of St. James's, Piccadilly, and formerly Bishop of Sydney.

SANITARY AND ENGINEERING NEWS.

Conisborough and Denaby Sewerage Scheme.—A Local Government Board inquiry has been held by Mr. A. E. Sandford Fawcett, C.E., at Conisborough, into an application by the Doncaster Rural District Council for sanction to a loan of 10,000*l.* for works of main sewerage and sewage disposal for the towns of New Conisborough and Denaby Main. The scheme, which was prepared by Messrs. D. Balfour & Son, of London and Newcastle, consists of the laying of sewers of 21, 18, 15, 12, and 9 inches diameter, at varying depths, with manholes, ventilators, automatic flushing-chambers, &c. The whole of the sewers will discharge into a storage tank of 80,000 gallons capacity, from which the sewage will be pumped by engines and pumps in duplicate to the highest part of the disposal land. It will then be treated in two of Ducat's self-acting aerating bacterial filters, the effluent from which will pass on to 8 acres of land, which consists of loam overlying sand and sandstone rubble. The effluent will finally discharge into the River Don. The Inspector went over the whole of the locality and examined the existing work at Old Conisborough, including the site of the proposed cast-iron siphon, which will do away with the pumping of 80 per cent. of the sewage.

Water Supply, Wadebridge, Cornwall.—The concrete reservoir which has been constructed on the top of White Rock Hill, Dunveth, in connexion with the new water supply for Wadebridge, was opened on the 28th ult. The reservoir has a capacity of 220,000 gallons. Provision has been made for flushing the sewers of the town by the construction of a concrete tank, fed by overflow water, and discharging, automatically, when full, 5,000 gallons of water. The engineer of the scheme was Mr. G. H. Harris, of Wadebridge. The cost was about 6,000*l.*

MISCELLANEOUS.

Penrhyn Quarries.—The quarries were opened for work on the 5th inst., but so far the men do not seem to be disposed to return.

Electric Lighting Scheme, Mexborough, Yorks.—On the 20th ult., at the Mexborough Market Hall, Mr. F. H. Tulloch held a Local Government Board inquiry into an application by the Mexborough Urban District Council for sanction to borrow 13,400*l.* for purposes of electric lighting, and 4,600*l.* for the provision of a refuse destructor. The engineer, Mr. Waring, explained the electric lighting scheme, and Mr. G. F. Carter, surveyor, gave details of the refuse destructor. The site proposed is near the junction of Oxford-street and Station-lane.

Memorial Tablet, Marischal College, Aberdeen.—A bronze tablet in memory of Professor William Macgillivray, the naturalist, was unveiled on the 20th ult. in the natural history classroom, Marischal College, Aberdeen. The tablet is 3 ft. 6 in. by 2 ft. 6 in., and was designed by Mr. Ashbee, of London, and executed by the Associated Guild of Handicraft.

London County Council Parliamentary Bills.—The Council have prepared six measures to be introduced in the course of the ensuing Session. In respect of Metropolitan improvements they seek for powers, subject to the Vestries of Fulham and Chelsea consenting to the proposed tramway from Battersea Bridge to Putney Bridge, and agreeing to contribute between them one-third of the net cost of the widenings, to widen New King's-road and World's End-passage, King's-road; to widen Richmond-road, subject to a similar consent by the Vestry of Hammersmith to the proposed tramway from Uxbridge-road to Shepherd's Bush-road; to widen Scrubb's-lane, Brook Green-road, and Fulham Palace-road, subject to a consent by the Fulham and Hammersmith Vestries to the proposed tramway from Harlesden to Putney Bridge, and to contribute between them one-third of the net cost of the street widenings; to widen Strath-terrace and Bolingbroke-grove for the proposed tramway from St. John's-hill to Trinity-road, subject to a contribution by the Battersea Vestry of one-fourth of the cost; to widen Red Lion-street, South-street, Garratt-lane, Defoe-road, and High-street, Tooting, for the proposed tramway from York-road to High-street, Tooting, if the Wandsworth District Board will contribute one-third of the net cost of the widenings, such contribution not to exceed 91,316*l.*; and to widen various thoroughfares along the route of the proposed tramway from Camberwell Green to Devonshire-road, Forest-hill, subject to a contribution of one-third of the net cost by the Lewisham District Board and the Vestries of Camberwell and Lambeth. Another Bill provides for a large number of new tramway lines, with the necessary widenings of streets, &c., in the County and the City of London, on both sides of the river, including a double line from Cheyne-walk (Battersea Bridge) along the Chelsea Embankment, Commercial-road, Buckingham Palace-road, Victoria-street, and Victoria Embankment to Blackfriars Bridge—the tramways to be laid on a gauge of 4 ft. 8½ in., and animal or electrical power to be employed. They propose to take over from the Thames Conservancy Board the piers, landing-places, &c., on the river's side between Chiswick Eyot and the artillery practice ground at Plumstead, to provide additional piers and so on, and to obtain authority for the Corporation or the Bridge House Estates trustees to contribute or subscribe to the outlay and maintenance involved. They promote a Bill for the acquisition of the Spitalfields Market area bounded by Lamb-street (north), Commercial-street (east), Brushfield-street (south), and Crispin-street (west)—another measure to that same intent will be introduced by the Corporation; and the Council also put forward their customary Bill for the purchase of the undertakings of the eight water companies who supply London, together with that of the Staines Reservoirs Joint Committee established under the Staines Reservoirs Act, 1896.

Marconi's Wireless Telegraphy.—We are informed that the whole process of wireless telegraphy will be demonstrated to the public in operation at the Manufacturers' Exhibition in aid of Essex disabled soldiers, to be opened at the Shire Hall, Chelmsford, of December 12, 13, and 14, where wireless messages will be sent and received at intervals of a few minutes during the time the Exhibition is open.

Electric Lighting in Leeds.—The Lighting Committee of the Leeds Corporation propose to make extensions of their electrical works. On the 28th ult. they decided to recommend the City Council to accept tenders amounting to 72,572*l.* for extending the existing works at Aire-street on the adjacent Britannia Mills site, which has already been cleared and prepared for such a development. In due course tenders will be invited for machinery.

The Harvey Steel Companies.—It is proposed to amalgamate the Harvey Steel Companies into one. There are at present four Harvey Steel Companies; one in this country, one in France, one in New Jersey (United States), and the Harvey Continental (Limited), whose territory includes all outside of Great Britain, Germany, France, and the United States. The proposal was announced at the eighth ordinary meeting of the Great Britain Company, on the 29th ult.

Court of Common Council.—On the 29th ult., at a meeting of the Court of Common Council at Guildhall, Sir Robert Rogers, chairman of the Improvements and Finance Committee, replying to Mr. Deputy Baddeley, said every effort would be made in carrying out the improvements in Cripplegate to maintain the ancient gateway leading to Cripplegate Church. But it was not contemplated to leave the entire north side of the church open to the public view. The Streets Committee brought up a report recommending that, under the Act of last Session, the Corporation should take over the possession and management of the garden space in the centre of Finsbury-circus from March 1 next, which was agreed to. It was decided to inform the London County Council that the Corporation would be prepared to join them in any action which might be mutually agreed to with a view to protect the interests of London gas consumers in the direction indicated by the resolutions passed at the conferences on the London gas supply at Guildhall and Spring-gardens last month. It was resolved that the statue of Sir Rowland Hill in front of the Royal Exchange should be taken over and maintained by the Corporation. In regard to the proposed improvement in Leadenhall-street, between Billiter-street and Aldgate, the Court resolved to intimate to the London County Council that it was desirable, in the interests of economy, that immediately it became known that premises were to be rebuilt or that leases were falling in notices should be served or negotiations commenced by the Corporation for the ground required, and that the Council should be asked for an assurance that if the work was carried out as indicated they would be prepared to contribute half the net cost of the improvement, from time to time as it proceeded. On the motion of Mr. A. C. Morton the committee were requested to inquire and report as to the desirability of widening the Fleet-street end of Fetter-lane to the extent of 40 ft.——A report was brought up from the Bridge House Estates Committee on the widening of London Bridge. They stated that they had considered two methods of widening the bridge—one by means of cast iron cantilevers and balustrade, and the other with granite corbelling or cantilevers and an open granite balustrade. Both designs, which were by Mr. Murray, City Surveyor, and Mr. E. W. Cruttwell, had in common the retention of the present four lines for vehicles, the lighting of the bridge from the middle of the roadway, and the expansion of the structure from 53 ft. to 65 ft. This would give a width of 34 ft. for vehicular traffic, 2 ft. 6 in. for central lighting, and 14 ft. to each footway instead of 9 ft. 6 in. as at present. The committee, having consulted Sir Benjamin Baker, were of opinion that the granite widening, though costly, was in thorough harmony with the character of the bridge, and was more likely to receive the sanction of Parliament than any design involving the introduction of cast iron. They therefore recommended that the granite design should be adopted, and the necessary Parliamentary authority be sought to carry out the same at an estimated cost not exceeding 100,000*l.* Mr. Turner, chairman of the Bridge House Estates Committee, in moving the adoption of the report, mentioned that the committee had had before them the question of the alteration of the gradient of Southwark Bridge, so as to assist the traffic of London Bridge, but they were not in a position to report upon that subject yet. Mr. Bowater moved as an amendment that the matter be referred back to the committee for further consideration and report. Mr. Wallace commented upon the need which existed for altering the approaches to Southwark Bridge so as to assist the traffic. On a show of hands the amendment was negatived, and the report was then carried.

Technical Education.—The President of the Board of Education has appointed a Committee consisting of Sir William de W. Abney, K.C.B., F.R.S. (Chairman), Sir Philip Magnus, Sir Swire Smith, Mr. G. R. Redgrave, Mr. W. Bousfield, and Mr. W. Vibart Dixon, with Mr. A. E. Cooper, Board of Education, South Kensington, as Secretary, to consider the best means for co-ordinating the technological work of the Board of Education with that at present carried on by other educational organisations.

Plans for the New Asylum for Cardiff.—A special meeting of the Cardiff Corporation was held on the 26th ult., his Worship the Mayor (Mr. T. Andrews) presiding. When the minutes of the Asylums Committee came up, Alderman Trounce drew attention to the correspondence with reference to the retirement of Mr. Kirkland from the plans competition. The Committee had decided at one meeting that they would not pay Mr. Kirkland the sum of 100*l.*, and at a subsequent meeting they decided to pay the money. That, on the face of it, was not satisfactory.—Mr. F. J. Veall replied that the matter had been fully considered by the Committee. They felt, on the one hand, that it would be unfair to allow Mr. Kirkland to compete after knowing that he was one of Mr. Hine's assistants. Besides that, he had a legal claim upon the Committee.—Mr. Morgan Thomas asked what explanation Mr. Hine gave of the fact that he did not communicate with the committee when he saw that Mr. Kirkland was one of the selected competitors. He thought that Mr. Kirkland should not be paid a single penny, because he knew that he was in Mr. Hine's employ.—Mr. Veall replied that they were not the keepers of Mr. Hine's conscience. Mr. Hine did not regard the matter in the same light as the committee did, and his position was supported by the President of the Institute of Architects. There should have been a clause in the conditions preventing such a thing.—Mr. A. M. Ingledew proposed that the minutes be referred back. Either Mr. Kirkland was disqualified and not entitled to the 100*l.*, or he was entitled to go on with the competition.—Alderman Trounce seconded.—Mr. S. A. Brain thought that no purpose could be served by referring the matter back. Mr. Hine had assured them that he did not know that Mr. Kirkland was a competitor until after he had made his award.—Alderman Carey explained that Mr. Hine knew that Mr. Kirkland was one of the six selected on the day after he made his award, but it was a week before the committee knew anything about it, and then they learned it from an outside source. It would have been nothing but fair if Mr. Hine had communicated with the committee immediately he found that one of his assistants had been selected. The committee, on the other hand, felt that they had to protect the fifty competitors, but if they rejected Mr. Kirkland upon the lines of the first resolution Mr. Hine would have withdrawn from the assessorship, and they would have had to delay the whole matter two or three months in order to begin again, and do all the work afresh. After further discussion, Mr. Ingledew withdrew his amendment, and the minutes were passed.—*Western Mail.*

LEGAL.

THE WORKMEN'S COMPENSATION ACT.

At Leeds County Court, on the 28th ult., before his Honour Judge Greenhow, an action was brought by Thomas Weir, labourer, 5, Madras-street, Leeds, against Henry Lax, contractor, and builder, of 192, Roundhay-road, for compensation for injuries received while in his employment on July 4.

Mr. A. Willey represented the plaintiff, and Mr. Child appeared for the respondent.

Mr. Willey, in stating the case for the plaintiff, said that the only serious point to be decided was whether the man could be described as coming within the terms of that section of the Act which said that a man to be entitled to compensation must be employed in, on, or about a building 30 ft. high, which was being constructed by means of scaffolding, or was being pulled down, &c. The facts of the case were that the plaintiff was in the defendant's employ, and on the day in question was excavating cellars to a house immediately adjoining some buildings already partially constructed. Mr. Lax had erected a number of buildings, some of which were completed and some partially erected, and the plaintiff was digging out the cellars for buildings immediately adjoining there. While so employed the earth fell in, and his leg was broken, and he was otherwise injured. He submitted that the whole work was one job, and that in consequence the plaintiff was entitled to claim that he was engaged in, on, or about these buildings.

The plaintiff having given evidence, and stated

that his weekly wage was 26s. 9½d., though he was paid by the hour.

Mr. Child submitted that the case did not come within the section, because the man was clearly neither in nor on the buildings. He was simply digging the soil on an entirely new plot of land, upon which no building whatever had been erected.

His Honour: There is no need to be engaged in the work of building. If you were reading a brief in the building, so long as you were employed there by the builder, you could recover damages if you were injured. This man was digging a foundation.

Mr. Lax gave evidence, and admitted that some of the adjacent buildings might have been 30 ft. high, but between any building of that height and the point where the plaintiff was injured there was a road. All the buildings in question were erected by himself.

After a lengthy argument, his Honour said his difficulty was over the word employment. He was inclined to think that if a man was liable to be ordered to any part of the work he was still employed about the building, in whatever particular part of it he might be engaged. Eventually his Honour gave judgment for the plaintiff on the ground that, though he was not working on the whole building, he was employed upon it, being liable at any moment to be sent to any part of it, and, moreover, that he was working in sufficiently close proximity to it to be said to be engaged "about" the building.—*Leeds Mercury.*

INJUNCTION AGAINST A DISTRICT COUNCIL TO RESTRAIN VIBRATION AND NOISE.

THE case of Hawkes *v.* the Leyton Urban District Council came before the Court of Appeal, composed of the Lord Chief Justice and Lords Justices Rigby and Vaughan Williams, on the 27th and 29th ult., on the appeal of the defendants from an order of Mr. Justice Buckley in the Chancery Division, who had granted the plaintiff an injunction restraining the defendants, their servants, and agents from carrying on their electric supply works at Leytonstone so as to cause a nuisance by vibration and noise to the plaintiff as owner and occupier of premises in Cathall-road, Leytonstone. The defendants admitted that there had been noise and vibration, but pleaded that since alterations at the works the nuisance no longer existed. The plaintiff, however, alleged that the noise and vibration caused by the engines was still sufficient to establish a case of nuisance, and Mr. Justice Buckley, being of the same opinion, granted an injunction, which the defendants now sought to have discharged.

Mr. H. Terrell, Q.C. (with him Mr. Dibden), in support of the appeal, said that the defendants as the Local Authority had, under the Electric Lighting Act, the duty cast upon them of establishing electric light work for the neighbourhood of Leyton, and they had established very considerable works, the whole of the streets of Leytonstone being now lighted by electricity. The demand for the light was very great. In the first instance the defendants worked their machinery by means of two gas-engines, but as the demand for the electric light increased the defendants had ultimately eight engines at work. With all these engines, however, defendants were not able to cope properly with the inordinate amount of light required, and they accordingly erected a steam-engine as a sort of stand by. In the working of gas-engines something occasionally went wrong and there ensued what was called "back-firing," which, explained counsel, was an explosion at the wrong side of the piston. At times, especially on Saturday nights, when the electric light requirements where very great, this back-firing took place, and defendants were unable to take off the engine at once as the supply would have been insufficient. The plaintiff's premises were some 200 ft. away from the works. The plaintiff was a horse dealer and had a residence there as well as some stables. The learned counsel said that his case was that it was only occasionally that there was an explosion and that therefore no injunction ought to have been granted; and, further, that under all the circumstances the injunction was far too wide and that it ought to have been limited to the use of particular gas-engines, so as to obviate the nuisance caused by back-firing. It was also part of his case that alterations had now been effected which would do away with the noise and vibration complained of. When the action was commenced the defendants were in course of erecting steam plant, which, to a great extent would obviate noise and vibration; but in the court below he (counsel) pointed out to the learned Judge that as the explosions were only intermittent and not continuous the case was not one for an injunction in the very wide terms in which it was granted. The injunction as it stood would apply to any machinery employed by the defendants, steam or otherwise, and whatever they did hereafter the plaintiff might turn round upon them and attack them on a motion to commit. At the present time two additional steam-engines were actually at work, and two more were on the premises and would be set to work in the course of a few weeks.

In answer to the Lord Chief Justice, the learned counsel said it was proposed to work the steam-engines as the main plant, but the gas-engines would be worked as a sort of auxiliary plant. Of course, in the event of back-firing occurring, they would at once be able to take off the engine. He was perfectly willing to let the injunction go, if it was limited to noise and vibration caused by the back-firing of the gas-engine, but in no case ought the injunction to be continued in the very wide terms in which it was granted. His main point, however, was that where there was merely temporary and not a continuing noise, it was not the practice of the Court of Chancery to grant an injunction.

The Lord Chief Justice: You cannot contend that electric lighting stations must be a nuisance. They are all over the place, and no doubt have cured their nuisances. You must make out that there is not a nuisance to justify us interfering.

Mr. Terrell: I say it was only temporary and occasional, and due to extraordinary circumstances. That is the whole point.

Continuing, the learned counsel contended that, at any rate, the injunction certainly ought to be limited to nuisance by gas-engines, otherwise if the defendants should substitute steam-engines for gas-engines, and the plaintiff should allege that a nuisance was caused by the steam-engines, and should move to commit the defendants, an entirely new cause of action would then be tried on affidavit instead of in the ordinary way, by the evidence of witnesses examined in Court.

Mr. Astbury, Q.C. (with him Mr. A'Beckett Terrell), for the plaintiffs, said that if this limitation of the order had been suggested before Mr. Justice Buckley he should not have objected.

In the result their lordships directed that the injunction should be limited to nuisance caused by the use of gas-engines, and directed that the defendants should pay the cost of the appeal, they not having asked Mr. Justice Buckley to make the order in the limited form.

MEESON *v.* LONDON SCHOOL BOARD.

THIS case was heard at the North London Police-court, November 2 and 30, before Mr. Fordham. The defendants had caused steam pipes to be fitted up at Upton House Infirmary, and the District Surveyor claimed a fee in respect of these as not being at low pressure. The pipe passed from the boiler-house through the bathroom to a coil in a passage, on each side of which there was a stop valve. In the bathroom there was a branch to a cylinder with a stop valve. The boiler could be worked to a pressure of 18 lbs. or 20 lbs. on the square inch. There was not a free blow-off. The Engineer of the School Board considered that the dividing-line between high and low pressure would be about 80 lbs., whilst the District Surveyor thought it would be about 5 lbs. on the square inch. The magistrate ordered the payment of the fee claimed and costs.

ANCIENT LIGHT DISPUTE IN FINSBURY.

IMPORTANT ACTION AGAINST A BUILDER.

THE case of the Home and Colonial Stores *v.* Colls came before Mr. Justice Joyce in the Chancery Division on the 3rd, 4th, and 5th insts.

Mr. Swinfen Eady, Q.C. (with him Mr. Hughes, Q.C., and Mr. Vernon) in opening the case said this was an action for an injunction to restrain defendant from obstructing the plaintiffs' ancient lights. There had been a motion by the plaintiffs for an interim injunction, and the action had been set down for trial without pleadings. The plaintiffs were an incorporated company having a large number of shops in different parts of the country, and the premises now in question were the plaintiffs' head offices in Worship-street, City, from which this large concern was managed. The plaintiffs had there something like 120 clerks. The plaintiffs' building was at the corner of Paul-street and Worship-street, Finsbury, and the only part here concerned was the Worship-street frontage. The plaintiffs were lessees of the premises for twenty-eight years from the Ecclesiastical Commissioners. The defendant was a builder and also lessee of premises which were to be erected on the opposite side of the road. According to the plans of the defendant's building, such building was to rise to a height of 42 ft., and that, the plaintiffs said, would obstruct their lights. This they would prove by expert evidence. On the site of the defendant's proposed building there had formerly stood premises 19 ft. 6 in. in height in occupation of job-masters. From this building a tarpaulin had been raised to a height of 36 ft. from the pavement—that was to say, 6 ft. less than the defendant intended to build—and the effect of this had been to darken considerably the plaintiffs' offices.

In answer to his lordship, Mr. Reginald Bray, Q.C., for the defendant said his client admitted that under his building contract he was bound to raise the building to a height of 42 ft.

Mr. Robert Willey, F.R.I.B.A., examined, said that as soon as he heard that it was proposed to build a much higher building than the one which stood on the site, he arranged to have a tarpaulin put up to a height of 36 ft. from the pavement. That was put up in the early part of November last year, and remained up for several days. He had inspected the plaintiffs' premises before the tarpaulin was up and while it was up. The erection of the tarpaulin made a serious diminution of light to the plaintiff's premises in the ground floor, being the southern half of the clerks' office, and on the first floor, and the directors' and other offices facing the Worship-street front. In the summer of the present year he heard that Mr. Colls proposed to erect a building of the height of 42 ft. In his opinion the effect of such a building would produce a substantial diminution of the light which the plaintiffs' premises at the present time enjoyed.

Mr. Hughes: In your opinion, would the diminution of light to which you refer interfere with the plaintiffs carrying on their business in the way they had hitherto carried it on?—That is my opinion.

Cross-examined by Mr. Bray:

To what height do you say the defendant can build on that land without causing a substantial diminution of light to the plaintiffs' premises?—I should say something like 25 ft. or 26 ft.

The witness added that that would leave the plaintiffs a very good—an exceptionally good—amount of light for London. He did not suggest that the defendant's proposed building would seriously injure the light to the top floor of the plaintiffs' premises, but it would be injured to a slight extent. He thought, however, that certain windows on the first floor would be much injured. There was a great deal of diffused light all over the street—40 ft. was not a narrow street. He thought that the light to the first floor windows of the plaintiffs' building would be much diminished by the defendant's proposed building, and that the light to the windows of the ground floor would be substantially or materially diminished.

Mr. Benjamin Tabberer, F.R.I.B.A., examined by Mr. Hughes, said he was District Surveyor of Greenwich. He had inspected the plaintiffs' premises on September 28 last. He saw the site of the defendant's proposed building. Assuming that the old building on the site was 19 ft. 6 in. high and the defendant proposed to put up a building 42 ft. high from the pavement, it would seriously diminish the light to the plaintiffs' ground-floor windows. It would certainly render the rooms darker and the plaintiffs would have to use more artificial light in order to carry on their business efficiently. The basement, or pavement lights, would also be materially darkened. The first-floor windows would also be affected to a certain extent, but not to such a prejudicial extent as the others.

Cross-examined by Mr. Bray:

Dealing with the first floor windows the witness said that assuming the measurements to be correct, 65 deg. of light was left to the plaintiffs' windows. Sixty-five deg. was a very fair light for rooms of that depth. He might call it a very good light if he were dealing with a proposed purchaser.

Supposing the defendant's house was built, would the selling or letting value of the plaintiffs' premises be injured in the market in the smallest degree?—That I could not say.

Cross-examination continued:

In ordinary cases in adjusting differences the 45 deg. rule was a good one, but it was not applicable to the present case on account of the depth of the plaintiffs' rooms. If the defendant's proposed building were erected, taking a line from the middle of the plaintiffs' first floor window, there would be an angle of 51 deg. of light left and apparently 47 deg. from the bottom. The upper light was more valuable than the bottom light, because it penetrated further into the room.

Professor Roger Smith also gave evidence in support of the plaintiffs' case.

Mr. Bray, in opening the case for the defendant, submitted that the case was substantially the same as that of Warren *v.* Brown, decided by Mr. Justice Wright in August last. In that case Mr. Justice Wright had held that the plaintiff was not entitled to an injunction to prevent obstruction of light, inasmuch as he had been left with sufficient light for the ordinary purposes of inhabitancy or business. Mr. Justice Wright held that the plaintiff was not entitled to an injunction for obstruction of light when it left him enough for ordinary purposes, although not enough for extraordinary purposes. He (counsel) quite agreed that the 45 deg. rule only applied in what might be called ordinary cases, but if ever there was a case in which that rule ought to be applied it was the present. Mr. Colls, the defendant, was a builder of great experience. He came first to look at the site in question in July or August last. He had had considerable experience in questions affecting light and air. As he was about to covenant to build to a particular height it was necessary for him to consider carefully his position with regard to ancient lights. Mr. Colls and his manager Mr. Elliott both formed the clear opinion that if they confined their building to a height of 42 ft. it would afford ample light for the plaintiffs and no action could be brought against Mr. Colls.

His Lordship: Most architects come and say they can build to 45 deg.

Mr. Bray: Well, in ordinary cases 45 deg. between architects forms a very useful rule, but when you get outside ordinary cases you cannot apply it.

The learned counsel, continuing, said that Mr. Elliott had seen Mr. Willey, the plaintiffs' architect,

and went over the plans of the proposed building with him. Mr. Willey asked Mr. Elliott what compensation the defendant was prepared to pay if he were allowed to build to the height of 42 ft., but the latter replied that he was not prepared to discuss that matter at all. Mr. Willey then said he could not consent to the defendant building higher than between 24 ft. or 25 ft., and afterwards the matter was placed in the hands of the solicitors.

Mr. Bray said that if his lordship, after having heard the evidence, felt any doubt or difficulty on the plans, he should ask his lordship to call in an independent surveyor to report to him on the matter. That was very often done, and the defendant had a strong opinion that the advice of an independent surveyor would be in his favour.

Mr. Robert Vigers, examined by Mr. Bray, said he was an architect, and had a very large experience in light and air cases all over London. He inspected the plaintiffs' premises on November 26 last. He formed the opinion without going into the plaintiffs' premises that there would be at least 45 deg. of light left to them after the defendant's building was raised, and in his opinion that was quite sufficient. In his opinion the defendant's proposed building would not affect the light coming to the clerks' room in the plaintiffs' premises to any material extent. The defendant's building must reduce the light coming to the plaintiffs' building to some extent, but he came to the conclusion that there was no damage to the property. He did not think that the warehouse or the basement windows would be damaged at all. Witness did not go up to the first floor, as he thought that there was no necessity if he was right as to the ground floor windows.

Cross-examined by Mr. Eady: He came to the conclusion that the plaintiffs would have, after the defendant's proposed building was erected, more than 45 deg. of light left. In his opinion anything beyond 45 deg. was a good, sufficient light.

Mr. Colls, examined by Mr. Nutter, said he was the defendant in the action, and was a builder and contractor in a large way of business, employing about 1,000 men. He intended building a warehouse on the site in question. Witness stated that in his opinion his proposed building would not materially affect the light of the plaintiff's premises.

Mr. Elliott, the defendant's manager, stated in his evidence that part of his duty was to inspect sites for building and to report upon them. He saw the site before it was taken, and had considered the question of lights. He came to the conclusion that a building 42 ft. high would not damage the plaintiff's premises. Messrs. Edward l'Anson, F.R.I.B.A., and Chas. Riley also gave evidence in support of the defendant's case.

At the close of the defendant's case Mr. Bray asked his lordship to send an independent surveyor to the *locus in quo* for the purpose of reporting to his lordship on the alleged obstruction of light by the proposed building.

His Lordship: To report to me as to a building which is not even begun yet?

Mr. Bray replied that it was often done in such cases.

His Lordship: What do you want the surveyor to do? As at present advised I have no doubt about the facts in this case, but I must say that I am impressed very much by the case decided by Mr. Justice Wright. I do not feel any doubt that there will be an actual diminution of light on the plaintiff's ground floor.

Mr. Bray said he would agree that that was so. He could not contest that.

His Lordship: It is obvious. It does not, however, follow from that that the plaintiffs are entitled to an injunction.

Mr. Swinfen Eady said that that was a legal question which they would have to discuss. He submitted, however, that there was no necessity for an independent surveyor reporting to his lordship on the matter.

His Lordship said he did not think such a report was necessary. There was no difficulty about the facts in the case. The difficulty was the law.

Mr. Bray said he would not press the matter further.

His Lordship: How can you make out that the plaintiffs have "sufficient" light according to Mr. Justice Wright's decision, whatever "sufficient" may mean in that case? In reference to that, I want you to deal with the facts as we know them about the electric light being used.

Mr. Bray submitted that the case the plaintiff made with regard to the depth of their premises ought to be entirely ignored. As a matter of law there could be no greater burden cast upon the servient tenement because premises were deeper than usual, just in the same way as it could not lessen the burden if the premises were only 3 ft. or 4 ft. deep. He submitted, as a consequence, that a man could not have his lights greater because he used his premises for an extraordinary purpose. His contention was that if a man put clerks in a room 52 ft. deep, with no back lights at all, he was using the premises for an extraordinary purpose. He submitted that the bottom of Mr. Justice Wright's decision was that a man was entitled to a certain amount of light passing through each square foot of his windows, and if a defendant built so as to diminish that quantity of light it was actionable. Then the question was, what is that quantity of light? That quantity of light was described "as sufficient for ordinary business purposes." You must take an ordinary room with an ordinary window, and if there was sufficient light for business purposes which would allow clerks to enter items in books and so on, that was the *quantum* of light which the plaintiff was entitled to have. That must have been what Mr. Justice Wright decided, because his lordship would recollect he found in Warren *v.* Brown that there was a material diminution of light on the ground floor of the plaintiff's premises.

His Lordship: Yes, the order in that case was made on the 10th of the month and an appeal was lodged on the 12th. I am not surprised. The decision is startling.

Mr. Bray: Yes, it is a very important point, and I am not submitting it is free from difficulty. Mr. Justice Wright had put before himself the question as to what was the *quantum* of light which a person entitled to ancient lights was entitled to, and the answer was "sufficient for ordinary business purposes." If Mr. Justice Wright was correct on the facts in that case, the present is a much stronger one, because the present plaintiffs would have admittedly more light than an angle of 45 degs. Again, in the case of Warren *v.* Brown, the road was only 19 ft. wide, and in the present case it is 40 ft. or 41 ft., which admitted a much greater quantity of diffused light. The learned counsel submitted that the plaintiffs had made out no case for an injunction.

Mr. Swinfen Eady replied on the whole case on behalf of the plaintiffs, submitting that the plaintiffs had made out a substantial case for an injunction. The learned counsel said that his answer to the question as to the amount of light a person was entitled to was "the same as he had hitherto enjoyed."

At the conclusion of the arguments of counsel, his lordship reserved judgment.

POINT AFFECTING ARCHITECTS.

THE case of Metchim & Son *v.* the Hotel Cecil, Limited, came before Mr. Justice Kennedy and a special jury in the Queen's Bench Division on the 5th inst.—an action brought by the plaintiffs, a firm of printers in Westminster, for 123*l.* 17*s.*, the balance of an account for work and labour done and goods supplied for and to the defendants. The facts were shortly these:—In 1896 the defendants appointed Messrs. Perry & Reed, of John-street, Adelphi, their architects, who prepared plans and made out bills of quantities in connexion with the building of the Hotel Cecil. Numbers of extra copies of their estimates and specifications were sent to the plaintiffs to be lithographed, and down to May 3, 1897, their bill was paid by the defendants. In January, March, and May of 1897 the architects ordered the plaintiffs to lithograph fifteen copies of an estimate and eleven copies of a plan prepared by them for the hotel. The work was done for 97*l.*, and an account sent to Messrs. Perry & Reed, who were debited with that amount in the plaintiffs' books. On July 21, 1898, Messrs. Perry & Reed ordered the plaintiffs to lithograph twenty copies of bills of quantities connected with the building of the north block of the Hotel Cecil. That was also done, and the account for 26*l.* 17*s.* was also sent by the plaintiffs to the architects, who were debited with that amount in the plaintiffs' books. In October, 1898, a dispute arose between Messrs. Perry & Reed and the defendants, and Messrs. Perry & Reed ceased to be their architects. The plaintiffs sent in their account to the defendants in October, 1899, but they declined to pay it, on the ground that the cost of all copies of plans and estimates was included in the architects' fees and commission, and should be paid by them.

After hearing evidence, the jury returned a verdict for the plaintiffs for the amount claimed, and judgment was entered accordingly.

Mr. Roger Wallace, Q.C., Mr. Eldridge, and Mr. Metchim appeared for the plaintiffs; and Mr. Rawlinson, Q.C., and Mr. Ashton for the defendants.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

15,828.—A PACKING FOR JOINTS: *F. A. Thoenes.*—The packing consists of asbestos or other cord wound into a spiral ring, with, it may be, the addition of metal wire strands, the ring being embedded in india-rubber or fixed with a solution of rubber; for the winding process a core or flanged disc is employed.

15,889.—BALL-AND-FLOAT VALVES: *F. Wangelin.*—In the case of water-supply valves for closet flushing-tanks, cisterns, and so on, after the kind specified in No. 10,138 of 1896, the closing of the valve—the two chambers that constitute the cistern being at the time full—is brought about by means of a projection upon the pivoted lever, at whose one end is an adjustable weight and at the other a small water-tight container. When the two chambers of the cistern are empty, the descent of the container allows the valve to become opened, the flow of water through its outlet into one chamber is prevented from pouring into the other chamber by means of a non-return valve until it flows over the partition that is placed between them. The appliance comprises an adjustable seating for the valve, which is grooved in order that a screw-driver may be inserted therein.

15,907.—WINDOW FRAMES: *H. Simon.*—In the corners of the frame are fashioned, with a hollow cutter, right-angled slots or recesses for metal angle-plates or pieces which join together the rails and bars of the frame; to the cutter is attached a cross-piece, having a handle, which can be detached when the cutter needs to be sharpened.

15,922.—A FIRE-ALARM APPARATUS: *F. Gray.*—By this contrivance, which can be used alike with wet and dry systems of sprinkling which combine alarms with automatical sprinklers, an indication is given when the sprinklers are in action, or when some one has tampered with the main water-supply valve; when the pressure varies, by either excess or defect, from a certain determined amount, a pressure gauge will close an electrical bell circuit, by means of the movement to one side or the other of a gap which is cut in the edge of a disc clamped upon the pressure-gauge's spindle. If the gap stands opposite the spring contacts no current will pass to the bell, but when the gap is moved aside the circuit becomes closed and is so maintained by the disc's contact with the springs. The gauge, with its bell, connected to the distributing pipes of the sprinklers, and another gauge is attached to the main water-supply sliding valve, which puts the latter gauge into communication with the distribution pipes when it has become closed and, by thereupon changing the pressure on the gauge, causes the alarm to sound. Similarly, any alteration of the amount of pressure will start the other valve when the sprinklers have been opened.

15,947.—APPLIANCES FOR WINDOWS: *W. Taylor.*—Hinge or pivot pins are fixed on to the frame, and eyes which are secured to the casement or sash slide upon the pins. For purposes of cleaning it the casement can be turned into a recess made in the window-head, or it can be lifted into the recess when ventilation is desired. Over the top of the window is a door, or flap, which controls the admission of air, and will become closed when the window is lowered on to the sill, whilst the entrance of water is obviated by means of vertical grooves that are cut in the abutting stiles of the frame and the window. When the casement has been closed, a locking-pin, which is pivoted on to a spring lever mounted upon the casement stile, engages with a hole cut in the frame.

15,964.—A METHOD OF VENTILATING: *F. K. Coady and F. F. Coady.*—The inventors devise a fireproof and waterproof ceiling, made of metal or some other material, for use in kitchens, bath-rooms, &c., in the centre of the ceiling which is inclined downwards to its edges are an opening with radial grooves, and a flange with which the ceiling can be secured to the walls; the aperture at the centre is placed in communication with a ventilating-shaft, and pipes are provided for carrying off the water that collects in the grooves.

15,992.—LOCKS AND BOLTS FOR SAFES: *G. H. Steinforth.*—A key or handle serves to turn a bolt which is in the form of a segment of a ring into engagement with the safe's side-plate, the ends of the bolt—which is attached to or made in one piece with a pivoted plate—will lie flush with the lock-plate when they are turned back; the bolt is designed in this especial form so that it shall not be forced backwards by illegitimate means, such as the drilling of holes in the side-plates and the use of a punch, and in order to prevent any forcing outwards of the side-plates; the lock which secures the bolt when shot has a key that engages with a pivoted lever and will draw the latch-bolt out; a further turning of the key lifts the tumblers and so draws the locking-bolt backwards.

16,000.—DOVETAILING, FOR CABINET WORK: *M. Robinson.*—A head, which is affixed to the driving spindle, and a socket whereof each has a hole of the same eccentricity constitute a holder for rotatory cutters employed in cabinet dovetailing work, the cutter is held in the hole of the socket and the socket in the hole of the head, for making the cutter run truly, or for varying the size of the dovetail required, an adjustment can be effected of the respective eccentricities of the cutter and the socket.

16,006.—A FLUSHING CONTRIVANCE: *F. C. Getting.*—The inlet valve of the tank which is cylinder-shaped is connected by means of a joint or hinge to a rod that is hooked at its upper end on to the end of the rocking lever, the rod moving in a guide-bracket, a pawl mounted upon the float arm will engage with a recess formed in the middle portion of the rod when the valve for discharge is lifted, and will thereby support it in that position until it becomes freed through the fall of the float.

16,009.—A TOOL FOR MOULDING STONE: *C. Collins and E. Collins.*—A capping piece, washers, and bolts secure the cutter and two back irons, which are fashioned with the required profile, in a recess made in the holder, the cutter, whose cutting edges may be upon one side or upon both sides, abuts against a filling-piece which is placed between the back irons.

16,050.—MANUFACTURE OF PORTLAND CEMENT: *C. von Forell.*—The cement is composed of granulated calcareous materials, for instance, limestone, marl, chalk, and so on, mixed with granulated blast-furnace slag, which are first rendered friable

by being heated to a clear red heat, and are then ground to powder and burned. Portland cement will be formed by grinding the clinker thus made.

16,071.—KEYS FOR LOCKS: *C. T. Schneider.*—The barrel and the key-bits are formed separately, the latter being cut out of sheet-metal strips that have been rolled or drawn so as to present the necessary sections.

16,088.—A HOLDER FOR FRENCH WINDOWS, CASEMENTS, DOORS, &C.: *H. F. A. Lohmann.*—The appliance for retaining doors and windows in their position when opened comprises a bar whereof the end is flattened out so as to constitute a spring, the bar being pivoted on to the window-sill or other suitable place, and having an eye which is to be engaged by a guide-rail upon the door or window; when the door has been opened a stud upon the end of the bar will spring into a recess, and will hold the door in that position until the door is liberated by the pulling of a knob.

16,090.—A MATERIAL FOR DOORS, SHUTTERS, &C.: *F. M. Leaver.*—Wood-pulp, paper sheets, or similar substances are stamped or pressed to the shape of the door or shutter, and have raised or sunken panels; they are then fixed together with glue or cement upon the opposite sides of a wooden frame, or are glued on to the frame, the panels being added afterwards.

16,123.—FASTENINGS FOR WINDOWS: *W. T. Head and N. P. Neilsen.*—In the window frame (or in the sashes) are mounted spring catches for engagement with notched plates secured to the sashes (or to the window frame). The catches will retain the sashes when the latter are closed and prevent them from being opened more when they have been once opened. Cranked handles or keys that work upon spindles serve to liberate the catches from within, and pivoted levers, when turned by arms projecting from the spindles, will withdraw the catch or bolt against the spring's action.

16,124.—A CONTRIVANCE FOR USE WITH HOISTING MACHINES, &C.: *E. Bruckscb.*—The inventor's object is to obviate the running twice successively in the same direction of hoisting and similar machines. He causes the reversing lever to be controlled in such a manner that the workman can move it only upwards in its guide, projections from the lever's side press against corresponding projections from a disc wherein are slots cut diameter-wise, which engage with two pins upon two bolts, one of which blocks the further motion upwards of the lever after the lever has been moved once upwards and then downwards; but when the lever has been moved downwards and then upwards its further motion downwards becomes similarly blocked. The disc must be turned by the hand in order to move the lever twice in the same direction.

16,126.—A METHOD OF MOULDING BRICKS: *G. L. Rolfe.*—A shoot and a hopper feed the clay to the moulds, the clay is then pressed with plungers against a platen joined by rods to a cross-shaft so that cams, levers, and rods may force it over the mould table from which, however, the platen is kept free by means of cam studs that act upon the levers which sustain the shaft, separate mechanism is provided for the plungers; cam levers and links pivoted on to the plungers expel the bricks from the moulds, when the moulding has been done cams that move upon sliding connecting-rods come into play for moving the platen clear from the table, and as the platen crosses over the table its under surface is cleaned with a wiper; the mould box is made so that it can be detached, and vertical screws, whose yokes hold up the plunger shaft's ends when the cross-head is lowered, regulate the amount of feed to the moulds, a lever and pins that project from one side of the reciprocated hopper working the shoot's cutting-off slide.

16,221.—AN APPLIANCE FOR LAVATORY BASINS: *Peck Brothers & Co.*—A disc is secured to the lower end of a spindle upon which the plug-valve is mounted, when a handle near the basin's rim is turned its rotation is communicated by means of a universal joint to a shaft (beneath the basin) at whose remoter end are a disc and an eccentrical pin. The pin lifts and depresses the plug-valve by means of its action upon the disc at the end of the plug-valve's spindle.

16,225.—CONDUITS FOR ELECTRICAL CONDUCTORS: *W. H. Nichols & Henley's Telegraph Works Company.*—In order that the sections may lie flatly upon their bed of concrete the conduits, which are made of earthenware, are fashioned with a rectangular section, with socket joints around their tops and sides only.

MEETINGS.

FRIDAY, DECEMBER 7.

Architectural Association.—Mr. A. Wallace Rimington on "Colour in Architecture seen through an Artist's Glasses," 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. F. K. Peach on "Dock Gates." 8 p.m.

Architectural Association of Ireland (Technical Demonstrations. III.).—Messrs. Alston and Hudman on "Timber." 2 p.m., at 99, Rogerson's Quay.

Glasgow Architectural Craftsmen's Society.—Mr. T. S. Fraser on "Some Principles of Design." 8 p.m.

SATURDAY, DECEMBER 8.

British Association of Waterworks Engineers.—Half-yearly Meeting at the Geological Society's Rooms, Burlington House, W. Presentation of Report from the "Water Boards" Committee on "The Control of Water Undertakings and Sources of Water Supply," and discussion. A paper will be subsequently read, entitled "The Protection of Underground Water," by Mr. Wm. Matthews, M.Inst.C.E. 11 a.m.

Institution of Junior Engineers.—Visit to the Electric Generating Station of the London United Tramways Company, 68, High-road, Chiswick. 3 p.m.

MONDAY, DECEMBER 10.

Surveyors' Institution.—Mr. R. E. Middleton on "The Future of the London Water Supply." 8 p.m.

Society of Arts (Cantor Lectures).—Professor J. A. Fleming, D.Sc., on "Electric Oscillations and Electric Waves." III. 8 p.m.

Clerks of Works Association (Carpenters' Hall).—Paper by Mr. Lewen Sharp. 7.30 p.m.

Society of Engineers.—Annual general meeting. 7.30 p.m.

Bristol Society of Architects.—Mr. G. Atwood Slater on "Architecture Critically and Poetically Considered." 8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. E. T. Hall on "The Leeds Infectious Hospitals." 6.30 p.m.

TUESDAY, DECEMBER 11.

Institution of Civil Engineers.—Papers to be read and discussed:—1, "The Signalling on the Waterloo and City Railway"; and 2, "Note on the Signalling of Outlying Siding Connexions," by Mr. Alfred Weeks Sdumper; and 3, "Signalling on the Liverpool Overhead Railway," by Mr. S. B. Cottrell. 8 p.m.

WEDNESDAY, DECEMBER 12.

Society of Arts.—Professor F. Clowes, D.Sc., on "The Treatment of London Sewage." 8 p.m.

Society of Engineers.—Annual dinner.

Institute of Sanitary Engineers (Incorporated).—Half-yearly general meeting at 5 p.m.; annual dinner at 6 p.m. (Holborn Restaurant).

Institution of Civil Engineers.—Students' visit to the Engine Works of Messrs. James Simpson & Co. Assemble at the Works, 101, Grosvenor-road, Pimlico, S.W. 2.30 p.m.

Edinburgh Architectural Association.—Mr. G. S. Aitken, F.S.A., on "Bothwell Castle." Illustrated by limelight views. 8 p.m.

Northern Architectural Association.—7.30 p.m.

THURSDAY, DECEMBER 13.

Institution of Electrical Engineers.—8 p.m.

FRIDAY, DECEMBER 14.

Architectural Association (Discussion Section).—Mr. H. V. Crawfurth-Smith on "The Churchyard and its Accessories." Mr. G. H. Fellowes Prynne will attend as special visitor. 7 p.m.

Institution of Junior Engineers (Westminster Palace Hotel).—Mr. J. H. Davy James on "The Metallurgy of Tin." 8 p.m.

Institution of Mechanical Engineers.—Mr. H. A. Humphrey on "Power-Gas and Large Gas-Engines for Central Stations." 8 p.m.

Architectural Association of Ireland (Technical Demonstrations).—Mr. Thomas Hudman on "Timber," at the Dublin Timber Company, Limited, Lower Ernestreet. 4.30 p.m.

SATURDAY, DECEMBER 15.

Dundee Institute of Architecture.—Visit to new additions at West Green Asylum.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

November 21.—By GERMAN & GERMAN (at Ashby-de-la-Zouch).

Ashby-de-la-Zouch, &c., Leicester.—The Breedon Estate, about 381 acres, f. (in numerous lots) £20,536

November 24.—By FRANCIS PITTIS & SON (at Newport).

Arreton, Isle of Wight.—Stile House, and ½ acre, f. 400
Vale Cottage, also house and blacksmith's shop adjoining, area 3 a. 2 r. 19 p., f. 1,075
Two enclosures of land, 2 a. 2 r. 3 p., f. 250
Blackwater House and 69 a. 2 r. 22 p., f. 3,000
Two freehold cottages 385

November 26.—By TOOTH & TOOTH.

Oxford-st.—No. 480, a profit rental of 100*l.* for 6¾ yrs. 540
Pall Mall.—21, Suffolk-st., u.t. 19½ yrs., g.r. 52*l.* 14s. 3d., r. 200*l.* 1,720
Hyde Pk.—16, Cambridge-st., u.t. 19½ yrs., g.r. 10*l.*, r. 100*l.* 1,060
26, Cambridge-st., u.t. 22¾ yrs., g.r. 10*l.*, r. 105*l.* 1,100
Fitzroy-sq.—23, Southampton-st., u.t. 23½ yrs., g.r. 6*l.* 16s. 6d., r. 75*l.* 650

By MAY & PHILPOT.

Camberwell.—148 and 150, Wells-st., f. 810

By WEATHERALL & GREEN.

Thornton Heath.—Brigstock-rd., The Railway Telegraph Hotel, f.g.r. 30*l.*, reversion in 62 yrs. 1,200

By T. V. PRICE (at Builth Wells).

Gwenddwr, Brecon.—Bedwhir Farm, 61 a., f. 1,300

By J. H. BETHELL (at Ilford).

Romford, Essex.—Kensington-rd., &c., 36 plots of building land, f. (in lots) 1,931

November 27.—By DEBENHAM, TEWSON, & CO.

New Bond-st.—No. 164, Corporation Lease, g.r. 9*l.*, fine 42*l.*, r. 915*l.* 22,700
Hoxton.—84, 86, and 88, Hoxton-st., f., r. 160*l.* .. 3,775
57, Red Lion-st., f., r. 5*l.* 230
30, Red Lion-st., f., r. 161*l.* 4s. 1,360
89, 91, and 95, Kingsland-rd., f., r. 135*l.* 3,080
Kingsland-rd., The Model Arms b.-h., f., r. 65*l.* 1,420
Hoxton-st., The Red Lion p.-h., f.g.r. 100*l.*, reversion in 91½ yrs. 3,000
Hoxton-st., f.g.r. 30*l.*, reversion in 90½ yrs. 1,360
Red Lion-st., f.g.r. 155*l.*, reversion in 43½ yrs. 3,890
Red Lion-st., f.g.r. 42*l.*, reversion in 88½ yrs. .. 1,060
Red Lion-st., f.g.r. 15*l.*, reversion in 90½ yrs. .. 375

By NOKES & NOKES.

Holloway.—181 and 183, Fairbridge-rd., u.t. 66½ yrs., g.r. 12*l.* 505
Caledonion-road.—2, Lavina-grove, f., r. 33*l.* 500

By RUTLEY, SON, & VINE.

Camden Town.—48, Werrington-st., u.t. 44 yrs., g.r. 6*l.* 465
Kentish Town.—2, Leverton-place, u.t. 41 yrs., g.r. 6*l.*, r. 45*l.* £320

By SIBLEY, COOKES, & BURRELL.

Peckham.—55 and 57, Lower Park-rd., f., r. 55*l.* 965
67 and 69, Lower Park-rd., f., r. 40*l.* 720

By A. C. LOVEYS (at Moretonhampstead).

Moretonhampstead, Devon.—The Leign Estate, 167 a. 2 r. 39 p., f. 2,100

By A. ROBERTSON (at Camberwell).

Bermondsey.—12 and 14, Catlin-st., u.t. 47 yrs., g.r. 10*l.* 530
133 and 135, Southwark Park-rd., u.t. 22 yrs., g.r. 7*l.* 390
7, 8, and 9, New-pl., u.t. 33 and 40 yrs., g.r. 8*l.* 10s. 465
Rotherhithe.—18, St. Mary Church-st., f. 135
Camberwell.—154, Boyson-rd., u.t. 51 yrs., g.r. 6*l.* 10s. 475
334 and 336, Albany-rd., f., r. 70*l.* 2,260

By MONTAGUE HARRIS (at Abergavenny)

Longtown, Hereford.—Old Court Estate, 185 a. 1 r. 17 p., f. 2,280

By FLEURET, SONS, & ADAMS (at Masons' Hall Tavern).

Carshalton.—Mill-lane, the Lord Palmerston b.-h., f., r. 35*l.* 2,500
Bethnal Green.—Venice-st., the Bee Hive b.-h. and cottage adjoining, f., r. 100*l.* 3,120
Limehouse.—Maroon-st., the Waterman's Arms b.-h., c., r. 40*l.* 2,500

November 28.—By BURLEY & BRACKENBURY.

Ealing.—13 and 16, High-st., c., r. 75*l.* 2,170
1, Sunnyside-rd., f., c.r. 40*l.* 580

By HODSON, RICHARDS, & CO.

New Malden, Surrey.—Lime-grove, The Lodge and 1¾ acres, f. 1,700
Thornton Heath, Surrey.—Bensham Manor-rd., f.g.r. 10*l.* 10s., reversion in 63 yrs. 410

By G. PEARCE & SONS.

Hoxton.—12, 14, and 16, Brunswick-place, u.t. 34 yrs., g.r. 81*l.*, r. 129*l.* 950
Craven-st., a rent charge of 26*l.*, for 17 yrs. 270
Haggerston.—41 and 43, Dunston-st., u.t. 18 yrs., g.r. 7*l.* 350
12, 14, and 16, Stean-st., u.t. 18 yrs., g.r. 9*l.* ... 525
Notting Hill.—Bramley-rd., &c., f.g.r. 36*l.* 10s., u.t. 63 yrs., g.r. 6*l.* 705
Holloway.—Fonthill Mews, f.g.r.'s 14*l.*, reversion in 67 yrs. 2,960
724, Holloway-rd., f., e.r. 85*l.* 1,580

By PERCY W. SLARK & CO.

Tottenham.—54, Park-lane, u.t. 78 yrs., g.r. 8*l.*, r. 20*l.* 280
Notting Hill.—36, Bosworth-rd., u.t. 66 yrs., g.r. 7*l.* 800

By R. TIDEY & SON.

De Beauvoir Town.—160, Hereford-rd., u.t. 49½ yrs., g.r. 13*l.* 230

By TURTLE & APPLETON.

Wandsworth.—12 and 70, Harbut-rd., u.t. 78 yrs., g.r. 13*l.* 10s. 730

By C. P. WHITELEY.

Barnes.—High-st., St. Ann's and 5 a. 0 r. 5 p., f. 6,350

By DOUGLAS YOUNG & CO.

Camberwell.—10 and 12, Luxor-st., u.t. 64 yrs., g.r. 14*l.*, r. 74*l.* 640
Brixton.—7 and 9, Branksome-rd., u.t. 67 yrs., g.r. 12*l.*, r. 66*l.* 580
Dulwich.—Thurlow Park-rd., St. Leonard's and Blythwood, u.t. 80 yrs., g.r. 13*l.* 5s., r. 96*l.* .. 930
Clapham.—83, Sandmere-rd., u.t. 80 yrs., g.r. 7*l.*, r. 42*l.* 370
Peckham.—4, Barfoth-rd., u.t. 75 yrs., g.r. 6*l.*, r. 36*l.* 340

By J. M. LEEDER & SON (at Swansea).

Llangyfelach, Glamorgan.—Blaen-Sciach Farm, 21 a. 1 r. 27 p., f. (together with mines and minerals underlying same) 1,925

By HENRY HENDRIKS (at Birmingham).

Birmingham.—Inkerman-st., f.g.r.'s 29*l.* 7s. (reversion in 84 yrs.) 890
115, Hurst-st., f., r. 170*l.* 4,200
Edgbaston-st., The Old Crown p.-h., f., r. 120*l.* 3,150
Claybrook-st., &c., 33 houses, also timber yard, warehouse, &c., u.t. 41 yrs., g.r. 81*l.* 12s. 5,525
Pershore-st., Art Metal Works, u.t. 38 yrs., g.r. 19*l.* 2s. 1,125
15, 16, and 17, Dean-st. (including a reversion), u.t. 65 yrs., g.r. 25*l.* 940
6 to 14, Dean-st., u.t. 16 and 23 yrs., g.r. 31*l.* 11s. 925
5 and 45, Upper Dean-st., u.t. 26 and 28 yrs., g.r. 13*l.* 2s. 6d. 830
Upper Dean-st., The Coach and Horses p.-h. and six houses adjoining, u.t. 26 and 28 yrs., g.r. nil 1,150

By BALCH & BALCH (at Camden Town).

Camden Town.—112, Torriano-avenue, u.t. 43 yrs, g.r. 6*l.* 365
Holloway.—33, Hargrave Park, u.t. 50 yrs., g.r. 8*l.* 8s., r. 35*l.* 385
53 and 55, Thorpedale-rd., u.t. 70 yrs., g.r. 11*l.*, r. 72*l.* 670
74, Parkhurst-rd., u.t. 31 yrs., g.r. 10*l.*, e.r. 65*l.* 535
Hampstead.—31, Ulysses-rd., u.t. 84 yrs., g.r. 5*l.* 19s., r. 34*l.* 400
Kentish Town.—25, Woodsome-rd., u.t. 60 yrs., g.r. 6*l.* 10s., r. 38*l.* 510

November 29.—By P. J. DIXON & SON.

St. Pancras.—2, Stibbington-st., u.t. 40 yrs., g.r. 17*l.* 10s. 330
Bethnal Green.—11 and 13, Vyner-st., f. 750

By FRANCIS & CO.

Clapham.—38, Jeffreys-rd., u.t. 41 yrs., g.r. 15*l.*, e.r. 50*l.* 315

By GENDLE & PRICE.

Croydon.—81, Gloucester-rd., f., r. 40*l.* 430

By HIGGINS & SON.

Hampstead.—18, Albion-rd., u.t. 44 yrs., g.r. 10*l.*, r. 65*l.* 645
St. John's Wood.—23, Charlbert-st., u.t. 27 yrs., g.r. 10*l.*, e.r. 45*l.* 360

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Municipal Buildings	South Shields Town Council	200*l.*, 100*l.* and 50*l.*	Dec. 31
*Public Offices	Hindley U.D.C.	50*l.*, 25*l.* and 10*l.*	Jan. 15

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
Sewerage Works, Gordon road, &c.	Barking (Essex) U.D.C.	C. F. Dawson, Surveyor, Public Offices, Barking	Dec. 11
Sewerage Works	Bedlingtonshire U.D.C.	C. D. Forster, 24, Grainger-street West, Newcastle-on-Tyne	do.
Road Widening, Crabble-road	Dover Town Council	H. E. Stilgoe, Civil Engineer, Town Hall	do.
Sewer, Richmond Hill-road	Aberdeen Town Council	W. Dyack, Burgh Surveyor, Town House	do.
Three Houses and Shop, Featherstone, Yorks		W. H. Fearnley, Architect, Station-lane, Featherstone	do.
Schools	Barking (Essex) School Board	C. J. Dawson, Architect, School Board Offices, Barking	do.
Repairs at Workhouse	Belfast Guardians	Young & Mackenzie, Engineers, Belfast	do.
*Road Making, &c., Works	Willesden District Council	Engineer, Public Offices, Dyne-road, Kilburn, N.W.	do.
*Making-up Roads	Wandsworth Borough Council	Council Offices, East Hill, Wandsworth	Dec. 12
Six Houses, Whitehead, Ireland		A. E. Wilson, 22, Waring-street, Belfast	do.
Church, Maestilo		D. Jenkins, Architect, Llandilo, Wales	do.
Cast-iron Pipes (270 tons)	Ayr Magistrates & Council	J. Young, Civil Engineer, Town Buildings, Ayr	do.
Club Premises	Hull & East Riding Club Co., Ltd.	B. S. Jacobs, Architect, Bowlalley-lane, Hull	do.
Street Works	Wallsend (Northd.) U.D.C.	G. Hollings, Surveyor, Council Offices	do.
Passage Works	Levenshulme U.D.C.	J. Jepson, Surveyor, Guardian Chambers, Tiviot Dale, Stockport	do.
Boiler House, Lingfield, near Bradford		Milnes & France, Architects, 90, Swan-arcade, Bradford	do.
Sewers, London-road	Bath R.D.C.	R. H. Sheppard, Surveyor, 3, North-parade, Bath	do.
Twelve Cottages, Omagh Asylum Estate, Omagh	Committee	J. L. Donnelly, Architect, Omagh	do.
Warehouse, Baildon Holmes, Shipley	Yorks Woolcombers' Assoc., Ltd.	Walker & Collinson, Architects, Swan-arcade, Bradford	do.
Culvert, Baxton Burn	Benfieldside U.D.C.	J. Dixon, Surveyor, Bank Buildings, Shotley Bridge	do.
Workmen's Dwellings	Wolverhampton Corporation	J. W. Bradley, Borough Engineer, Town Hall	do.
Sewerage Works	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	Dec. 13
*Brick Wall	Hackney Borough Council	Borough Engineer, Town Hall, Hackney, N.E.	do.
Granite Kerbing, Cubes, &c.	Leicester Corporation	E. G. Mawbey, Civil Engineer, Town Hall	do.
Chimney Shaft at Electricity Works	Dublin Corporation	S. Harty, Civil Engineer, City Hall	do.
Sewerage Works, Gurnard	Isle of Wight R.D.C.	H. E. Stratton, 30, Pyle-street, Newport	do.
Promenade Extension	Gravesend Town Council	Borough Surveyor, Town Hall	do.
Street Works, Foundry-place, Porth	Rhondda U.D.C.	W. J. Jones, Surveyor, Pentre, Glam	do.
Well, Pentre, Glam	do.	W. W. Hood, Civil Engineer, Llwynypia, Glam	do.
*Making-up Roads	Hackney Borough Council	Borough Engineer, Town Hall, Hackney, N.E.	do.
Sewer, Belmont	Durham R.D.C.	G. Gregson, Surveyor, Western Hill, Durham	Dec. 14
Paving Works, Ashton	Preston (Lancs) Corporation	Borough Surveyor, Town Hall	do.
Eight Houses, Lidget Green, Bradford	Great Horton Indus. Soc., Ltd.	J. Drake & Son, Architects, Queensbury, Yorks	do.
Building Work at School, Skene, Aberdeen		Jenkins & Marr, Civil Engineers, 16, Bridge-street, Aberdeen	Dec. 15
Infirmary	Donegal Guardians	E. J. Toye, Architect, Strand, Londonderry	do.
Road Stone, Newcastle		County Surveyor, Moot Hall, Newcastle-on-Tyne	do.
Cottage Homes, Peewit-lane, Great Hampton	Evesham Guardians	H. S. Harvey, Architect, Evesham	do.
*Sand, Ballast, &c.	Guy's Hospital	Superintendent Guy's Hospital, S.E.	do.
*Sewer	Hendon U.D.C.	Engineer, Public Offices, The Burroughs, Hendon, N.W.	Dec. 17
Sewerage Works	Dudley Corporation	J. Gammage, Borough Engineer, Town Hall	do.
Destructor Buildings	Mexborough (Yorks) U.D.C.	G. F. Carter, Civil Engineer, Council Offices, Mexborough	do.
Engine House, &c., Donnington	Newbury R.D.C.	S. J. L. Vincent, Civil Engineer, Market Place, Newbury	do.
Police Station, Sandside, Ulverston	Standing Joint Committee	H. Littler, Architect, County Offices, Preston	do.
Road Making	Burnham-on-Crouch U.D.C.	E. Dilliway, High-street, Burnham	do.
Street, Jack Royd Estate, Wheatley		G. Buckley & Son, Surveyors, Town-chambers, Halifax	do.
Sewerage Works	Baildon (Yorks) U.D.C.	Beesley, Son & Nichols, Engineers, 11, Victoria-street, S.W.	do.
Sewerage Works, Westbury-on-Trym	Barton Regis R.D.C.	A. P. J. Cottereil, Civil Engineer, 28, Baldwin-street, Bristol	do.
Shops, Church-street, Lancaster	Lancaster and Skerton Co-op. Soc.	Austin & Paley, Architects, Castle Park, Lancaster	do.
Shops, &c., New-street	do.	do.	do.
Surveyor's Materials	Horsham (Sussex) County Council	W. B. Purser, Civil Engineer, 31, Bedford-road, Horsham	Dec. 19
Chapel, Butterwick, near Boston	Committee	W. Martin, Ivy Cottage, Butterwick	do.
Additions to St. Luke's Church, Great Bridge, Staffs	Skenfrith (Abergavenny) Sch. Bd.	J. Pearson, Market Place, Great Bridge	do.
Alterations to Schools	Kent County Lunatic Asylum	J. H. Farquhar, Abergavenny	Dec. 20
*Making-up Roads, &c.	Belfast Corporation	See Advertisement	Dec. 21
Abattoir, Stewart-street	Winwick County Asylum	City Surveyor, Municipal Offices	do.
*Wiring, &c	Llandudno U.D.C.	Clerk, County Offices, Preston	Dec. 29
Extension of Promenade	do.	E. Paley Stephenson, Engineer, Church Walks, Llandudno	Dec. 31
Cast-iron Pipes, &c. (200 tons)	Acton District Council	do.	do.
*Road Materials	Wilts Standing Joint Committee	Surveyor, Council Offices, 242, High-street, Acton	Jan. 8
*Police Station at Cricklade, Wilts	Messrs. Baker & Elliott, Limited	See Advertisement	Jan. 10
Granite Paving Cubes (1,000 tons), Liverpool		C. J. Wills, 71, Mosley-street, Manchester	No date
Factory, Percy-street, Cardiff		Jones & Co., Architects, 18, St. Mary-street, Cardiff	do.
Villa, Pembury-road, Westcliffe, Southend-on-Sea		E. Wright, Architect, Southend	do.
Six Houses, Grange-avenue, Leeds		J. C. Spivey, Architect, Bank-street-chambers, Leeds	do.
Two Houses, Church-road, Gorleston		W. T. Bulley, 58, Church-road, Gorleston	do.
Additions to the Sun Hotel, Coniston		J. W. Grundy & Sons, Architects, Brogden-street, Ulverston	do.
Store Premises, South-street, Farnham		Hickley & Co., Architects, Station-road, Aldershot	do.
House, Farnborough		do.	do.
Club Premises, Crompton, Lancs		F. W. Dixon, Architect, Union-street, Oldham	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Application to be in
*Inspector of Works	Itchen U.D.C.	3*l.* per week	Dec. 10
*Clerk of Works	Walthamstow School Board	3*l.* 10*s.* per week	Dec. 14
*Engineer	Sheffield Corporation	250*l.* per annum	Dec. 15
*Surveyor	Felixstowe & Walton U.D.C.	200*l.* per annum	Dec. 18
*Building Inspector	Willesden District Council	150*l.* per annum	Jan. 1

Those marked with an asterisk (are advertised in this Number.* *Competitions, p. iv. Contracts, pp. iv, vi. viii. x. & xxi. Public Appointments, pp. xviii. xix. & xxi.*

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.		
Hard Stocks	1	16	0	per 1,000	alongside, in river
Rough Stocks and Grizzles	1	12	0	,,	,, ,,
Smooth Bright Facing Stocks..	2	18	0	,,	,, ,,
Shippers	2	6	0	,,	,, ,,
Flettons.....	1	10	6	,,	at railway depôt.
Red Wire Cuts ..	1	15	6	,,	,, ,,
Best Fareham Red	3	11	6	,,	,, ,,
Best Red pressed Ruabon Facing.	5	5	0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4	7	0	,,	,, ,,
Do., Bullnose	4	12	0	,,	,, ,,
Best Stourbridge Fire Bricks	4	4	0	,,	,, ,,
GLAZED BRICKS.					
Best White and Ivory Glazed Stretchers.....	13	0	0	,,	,, ,,
Headers	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	17	0	0	,,	,, ,,
Double Stretchers	19	0	0	,,	,, ,,
Double Headers..	16	0	0	,,	,, ,,
One Side and two Ends	19	0	0	,,	,, ,,
Two Sides and one End	20	0	0	,,	,, ,,
Splays, Chamfered, Squints	20	0	0	,,	,, ,,
Best Dipped Salt Glazed Stretchers and Headers ..	12	0	0	,,	,, ,,
Quoins, Bullnose, and Flats	14	0	0	,,	,, ,,
Double Stretchers	15	0	0	,,	,, ,,
Double Headers..	14	0	0	,,	,, ,,
One Side and two Ends	15	0	0	,,	,, ,,
Two Sides and one End	15	0	0	,,	,, ,,
Splays, Chamfered, Squints	14	0	0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.

	s.	d.		
Thames and Pit Sand	8	0	per yard,	delivered.
Thames Ballast	6	9	,,	,,
Best Portland Cement	33	0	per ton	,,
Best Ground Blue Lias Lime..	24	6	,,	,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 32s. 6d. per ton at rly. dpt.

STONE.

	s.	d.			
Ancaster in blocks	2	0	per ft. cube,	deld.	rly. depôt
Bath ,, ...	1	7	,,	,,	
Farleigh Down Bath ..	1	8	,,	,,	
Beer in blocks	1	6½	,,	,,	
Grinshill ,, ...	1	10	,,	,,	
Brown Portland in blocks	2	2	,,	,,	
Darley Dale ,,	2	1½	,,	,,	
Red Corsehill ,,	2	5	,,	,,	
Red Mansfield ,,	2	4½	,,	,,	
Hard York in blocks ..	2	10	,,	,,	
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2	8		per ft. super.	at rly. depôt
,, ,, 6 in. Rubbed Ditto..	3	0		,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1	3		,,	,,
,, ,, 3 in. self-faced Ditto	0	5½		,,	,,

SLATES.

in.	in.	£	s.	d.		
20 × 10	best blue Bangor..	11	5	0	per 1000 of 1200	at rly. dep.
,,	best seconds ,,	10	15	0	,,	,,
16 × 8	best ,,	6	2	6	,,	,,
20 × 10	best blue Portmadoc ..	10	18	0	,,	,,
16 × 8	best blue Portmadoc	6	0	0	,,	,,
20 × 10	best Eureka unfading green.....	11	2	6	,,	,,
16 × 8	,, ,,	6	15	0	,,	,,
20 × 10	Permanent green	10	0	0	,,	,,
16 × 8	,, ,,	5	12	6	,,	,,

TILES.

	s.	d.			
Best plain red roofing tiles..	41	6	per 1,000	at rly.	depôt
Hip and valley tiles....	3	7	per doz.	,,	,,
Best Broseley tiles	48	6	per 1,000	,,	,,
Hip and valley tiles....	4	0	per doz.	,,	,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57	6	per 1,000	,,	,,
Do. ornamental Do.	60	0	,,	,,	,,
Hip tiles.....	4	0	per doz.	,,	,,
Valley tiles.....	3	9	,,	,,	,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50	9	per 1,000	,,	,,
Hip tiles	4	1	per doz.	,,	,,
Valley tiles.....	3	8	,,	,,	,,

PRICES CURRENT (*Continued*).

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	16	10	0	18	0	0
Deals: best 3 by 9	14	10	0	15	10	0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.....	12	10	0	13	10	0
Battens: best 2½ by 6 and 3 by 6 ..	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds.....	0	10	0	,, ,,	,,	
	At per load of 50 ft.					
Fir timber: Best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	5	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Swedish balks.....	2	15	0	3	0	0
Pitch pine timber (35 ft. average)..	4	0	0	4	10	0

JOINERS' WOOD.

	At per standard.					
White Sea: First yellow deals, 3 in. by 11 in.....	27	10	0	28	10	0
3 in. by 9 in.	24	0	0	25	0	0
Battens, 2½ in. and 3 in. by 7 in.	20	0	0	21	0	0
Second yellow deals, 3 in. by 11 in.	22	10	0	24	0	0
,, ,, 3 in. by 9 in.	20	0	0	21	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	16	10	0	18	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	25	0	0	26	0	0
Do. 3 in. by 9 in.	22	0	0	23	0	0
Battens.....	16	10	0	17	10	0
Second yellow deals, 3 in. by 11 in.....	18	10	0	20	0	0
Do. 3 in. by 9 in.	17	0	0	18	0	0
Battens.....	14	0	0	14	10	0
Third yellow deals, 3 in. by 11 in.....	13	0	0	16	10	0
Do. 3 in. by 9 in.	14	0	0	14	10	0
Battens.....	12	10	0	13	10	0
White Sea and Petersburg:—						
First white deals, 3 in. by 11 in..	15	10	0	16	10	0
,, ,, ,, 3 in. by 9 in. ..	14	0	0	15	0	0
Battens.....	12	10	0	13	10	0
Second white deals 3 in. by 11 in.	14	0	0	15	0	0
,, ,, ,, 3 in. by 9 in.	13	0	0	14	0	0
,, ,, battens	11	0	0	12	0	0
Pitch pine: deals	16	0	0	18	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—						
First, regular sizes	30	0	0	33	0	0
Broads (12 in. and up)	2	0	0	more.		
Oddments	22	0	0	24	0	0
Seconds, regular sizes	24	10	0	26	10	0
Yellow Pine Oddments	20	0	0	22	0	0
Kauri Pine—						
Planks, per ft. cube	0	3	6	0	4	6
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	2	6	0	2	8
Small ,, ,, ...	0	2	4	0	2	7
Wainscot Oak Logs, per ft. cube ..	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	9
¾ in. do. do.	0	0	7	-	-	-
Dry Mahogany—						
Honduras, Tabasco, per ft. sup. as inch	0	0	9	0	0	11
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	0
Dry Walnut, American, per ft. sup. as inch.....	0	0	10	0	1	0
Teak, per load	16	0	0	20	0	0
American Whitewood Planks—						
Per ft. cube.....	0	2	1	0	3	0

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	8	7	6	9	7	6
Compound Girders ,, ,,	10	5	0	11	10	0
Angles, Tees and Channels, ordinary sections	11	2	6	13	2	6
Flitch Plates	11	0	0	11	15	0
Cast Iron Columns and Stanchions, including ordinary patterns	8	15	0	10	10	0

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
IRON.—						
Common Bars.....	9	15	0	-	-	-
Staffordshire Crown Bars, good merchant quality	10	5	0	10	10	0
Staffordshire "Marked Bars" ..	12	0	0	-	-	-
Mild Steel Bars.....	10	10	0	11	0	0
Hoop Iron, basis price.....	10	10	0	11	0	0
,, ,, galvanised	16	12	0	-	-	-
(* And upwards, according to size and gauge.)						
Sheet Iron, Black.—						
Ordinary sizes to 20 g.....	11	0	0	-	-	-
,, ,, to 24 g.....	12	0	0	-	-	-
,, ,, to 26 g.....	13	10	0	-	-	-
Sheet Iron, Galvanised, flat, ordinary quality.—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	13	5	0	-	-	-
,, ,, 22 g. and 24 g.	14	5	0	-	-	-
,, ,, 26 g.....	16	0	0	-	-	-
Sheet Iron, galvanised, flat, best quality.—						
Ordinary sizes to 20 g.....	27	10	0	-	-	-
,, ,, 22 g. and 24 g.	28	0	0	-	-	-
,, ,, 26 g.....	29	10	0	-	-	-
Galvanised Corrugated Sheets.—						
Ordinary sizes, 6 ft. to 8 ft. 20 g.	13	10	0	-	-	-
,, ,, 22 g. and 24 g.	14	0	0	-	-	-
Cut nails, 3 in. to 6 in..... (Under 3 in. usual trade extras.)	11	10	0	-	-	-

PRICES CURRENT (*Continued*).

METALS.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3 lbs. & up.	19	17	6	-	-	-
Pipe in coils	20	7	6	-	-	-
Soil Pipe..	23	7	6	-	-	-
ZINC—Sheet—						
Vieille Montagne ..... ton	27	0	0	-	-	-
Silesian.....	26	10	0	-	-	-
COPPER—						
Strong Sheet..... per lb.	0	1	1	-	-	-
Thin ..... ,,	0	1	3	-	-	-
Copper nails ..... ,,	0	1	3	-	-	-
BRASS—						
Strong Sheet..... ,,	0	0	11	-	-	-
Thin ,, ... ,,	0	1	1	-	-	-
TIN—English Ingots ..... ,,	0	1	5	-	-	-
SOLDER—Plumbers' ..... ,,	0	0	7½	-	-	-
Tinmen's ..... ,,	0	0	9½	-	-	-
Blowpipe ..... ,,	0	0	11	-	-	-

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d.	per ft. delivered.
,, fourths	2¾d.	,, ,,
21 oz. thirds	3¼d.	,, ,,
,, ,, fourths.....	3d.	,, ,,
26 oz. thirds	4¼d.	,, ,,
,, ,, fourths	4d.	,, ,,
32 oz. thirds	5¼d.	,, ,,
,, ,, fourths	5d.	,, ,,
Fluted sheet, 15 oz.	3¼d.	,, ,,
,, ,, 21 ,, ...	4¼d.	,, ,,
½ Hartley's Rolled Plate.....	3d.	,, ,,
⅝ ,, ,, ,, ...	3½d.	,, ,,
¾ ,, ,, ,, ...	4d.	,, ,,

OILS, &c.

	£	s.	d.
Raw Linseed Oil in pipes ..... per gallon	0	2	11
,, ,, ,, in barrels ..... ,,	0	3	0
,, ,, ,, in drums ..... ,,	0	3	2
Boiled ,, ,, in pipes..... ,,	0	3	2
,, ,, ,, in barrels ..... ,,	0	3	3
,, ,, ,, in drums ..... ,,	0	3	5
Turpentine, in barrels ..... ,,	0	2	9
,, in drums..... ,,	0	2	11
Genuine Ground English White Lead ...per ton	28	0	0
Red Lead, Dry..... ,,	25	0	0
Best Linseed Oil Putty.....per cwt.	0	9	6
Stockholm Tar ..... per barrel	1	10	0

VARNISHES, &c.

	per gallon. £	s.	d
Fine Elastic Copal Varnish for outside work ..	0	16	6
Best Elastic Copal Varnish for outside work ..	1	0	0
Best Elastic Carriage Varnish for outside work	0	16	6
Best Hard Oak Varnish for inside work	0	10	6
Best Extra Hard Church Oak Varnish for inside work	0	10	6
Fine Hard Copal Varnish for inside work	0	16	0
Best Hard Copal Varnish for inside work	1	0	0
Best Hard Carriage Varnish for inside work....	0	16	0
Extra Pale Paper Varnish	0	12	0
Best Japan Gold Size	0	10	0
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	9	0
Berlin Black	0	15	0
Knotting	0	10	0
Best French and Brush Polish	0	10	0

TO CORRESPONDENTS.

J. S. M. (Amounts should have been stated.) J. F. B. (Below our limit.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

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TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays*. N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BRACKLEY.—For additions to banking premises for the Bucks and Oxon Union Bank, Limited. Mr. Charles P. Ayres, architect, Watford, Herts:—

Booth.....	£2,027	Matthews	£1,765
Waterman	1,890	Orchard & Son, Banbury*	1,743
Hawkins	1,837		
Webster & Cannon..	1,798		

| *See also next page.*

BURNLEY.—For the execution of street works (twenty-five streets). Read, for the Rural District Council. Mr. S. Edmondson, C.E., 18, Nicholas-street, Burnley:—

Sett Paving.

James Green, Burnley* £1,625 10 8

Tar Paving.

Wm. Shepherd, Rochdale* £2,057 19 0

GT. THURLOW (Suffolk).—For two pairs of cottages at Bull Hill, for the Hon. W. F. D. Smith, M.P. Mr. Charles P. Ayres, architect, Watford, Herts:—

Smith & Son	£1,575	Mason & Son, Haverhill*	£1,930
Dupont & Co.	2,049		
S. Wiles	1,935		

HAMPRESTON (Dorset).—For the erection of a Church school, Hampreston, Wimborne, Dorset, for the Right Hon. Lord Wimborne. Mr. Walter Andrew, architect and surveyor, Parkstone:—

Froud	£889 15	A. & F. Wilson	£800 0
Baker & Pearcey	885 0	Burt & Vick, Poole*	785 0
W. J. Cross	810 0		

HUNDON (Suffolk).—For two pairs of cottages at Hundon Hall Farm, for the Hon. W. F. D. Smith, M.P. Mr. Charles P. Ayres, architect, Watford, Herts:—

Smith & Son	£1,825	Mason & Son, Haverhill*	£1,635
S. Wiles	1,640		

LONDON.—For the erection of offices in Grinstead-road, Deptford, for Messrs. Braby & Co., Limited. Mr. John James Downes, architect, 199, Lewisham High-road. Quantities by Mr. Henry Theobald, 6, South-street, Finsbury:—

Falkner & Co.	£6,983	H. L. Holloway	£6,434
Woodward & Co.	6,495	Thos. Sayers	5,910
J. & A. Oldman	6,479	Thos. D. Leng	5,720
Joselyn & Young	6,462	Jerrard & Sons	5,478
Johnson & Co., Ltd.	6,450		

NORTHWICK.—For the construction of sewers for the Rural District Council. Messrs. Bancroft & Son, C.E., 88, Mosley-street, Manchester:—

J. Taylor	£1,594 16 0	J. Dale	£1,050 4 10
T. Rowland	1,212 19 5	Beckett & Co.	927 1 5
Read & Son	1,208 15 0	S. Hutton, Bowdon*	909 7 3
S. Johnson	1,208 2 10		
Etheridge & Clark	1,090 4 3		

OSWESTRY.—For the execution of road works, Stewart-road, for the Town Council. Mr. G. William Lacy, C.E., Guildhall, Oswestry:—

W. Fellon	£396 10	J. Vaughan	£333 16
W. H. Thomas	375 0		

[Borough Surveyor's estimate, £281. Work to be done by the Borough Surveyor.]

PARKSTONE.—For alterations and additions to Sandecotes School, Parkstone, for the Right Hon. Lord Wimborne. Mr. Walter Andrew, architect and surveyor, Parkstone:—

T. C. Rigler	£370 1	Baker & Pearcey	£292 15
W. J. Cross	365 0	A. & F. Wilson, Parkstone*	284 0
Burt & Vick	325 0		
—Huxtable	298 0		

RHYL.—For the erection of a refuse-destructor and electric-light station buildings, for the Urban District Council. Mr. A. A. Goodall, surveyor, Clwyd-street, Rhyl. Quantities by Messrs. D. Howorth & Son, 22, Lord-street, Liverpool:—

Haigh & Co.	£7,990	Thornton & Sons, 38, Wellington-road, Toxeth Park, Liverpool*	£6,225
Lawrence, Marr, & Co.	6,490		

SOUTHEND.—For additions, &c., to Westward Ho! Westcliff-parade, for Mrs. Hocker. Messrs. Greenhalgh & Brockbank, architects, Bank-chambers, Southend:—

		Porch.
Davey Bros., Queen's-road Works	£4,419	£89 0
Golding, Princes-street	4,286	72 0
Woodwiss, Princes-street	4,151	51 5
Gillett, Queen's-road	4,070	60 0
Shelbourne & Co., Elmer-avenue	4,050	50 0
West, Chelmsford	3,600	53 0
Lavis & Leaney, Lancaster-gardens	3,525	46 0
Stubbs, Milton-street	3,525	53 15
Dupont & Co., Southchurch-road*	3,499	44 0

STAINES.—For rebuilding The Cabin, Staines. Messrs. Foulsham & Herbert Riches, architects, 3, Crooked-lane, King William-street, E.C., and Bromley-by-Bow, E. Quantities supplied:—

Derey & Co.	£2,573	Courtney & Fairbairn	£2,352
W. Slark	2,540	W. H. Pearce	2,340
Adamson & Sons	2,520	Sheffield Bros.*	2,295
F. Grant	2,400		

WATFORD (Herts).—For new stabling, &c., George street, for Messrs. W. E. Pearkes & Sons. Mr. C. P. Ayres, architect, Watford:—

C. Eames	£955 0	Reed & Saw, Watford*	£940 9
H. B. Watkins	945 0		

WATFORD (Herts).—For additions to the Watford Fields School for the Watford School Board. Mr. C. P. Ayres, architect, Watford:—

Ridgway & Sons	£4,179	W. King	£3,750
Reed & Saw	3,995	P. Banyard	3,660
C. Eames	3,963	Webster & Cannon	3,599
G. Wiggs	3,950	Dupont & Co.	3,545
Clifford & Gough	3,840	C. Brightman, Watford‡	3,485
G. & J. Waterman	3,824	R. L. Tonge	3,450
J. L. Tyler	3,799		

‡ Accepted subject to the approval of the Board of Education.

WATFORD (Herts).—For new warehouse, George-street, for Messrs. W. E. Pearkes & Sons. Mr. C. P. Ayres, architect, Watford:—

C. Eames	£718 0	Clifford & Gough, Watford*	£517 0
Reed & Saw	547 18		

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